



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF APPEALS

SECOND AMENDED BRIEF ON APPEAL

In re the application of Jeffry A. Pegg

Filed: December 15, 2003

Serial No.: 10/734,883

Group Art Unit: 3711

Examiner: Hunter, A.

For: Vertically Mass Balanced Putter

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for Appellant



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Examiner: Hunter, A.

Title: Vertically Mass Balanced Putter

SECOND AMENDED BRIEF ON APPEAL

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Sir:

This is an appeal from the final rejection of Claims 1-8 in the above-identified application.

REAL PARTY IN INTEREST

Jeffry A. Pegg, the inventor.

RELATED APPEALS AND INTERFERENCES

On August 28, 2005, Appeal was taken from the original Final Rejection dated “05/27/2005.” After Appellant filed its Amended Brief on Appeal on February 13, 2006, the initial Final Rejection was apparently withdrawn (without comment) and examination resumed by the Examiner. No action was taken by the Board of Appeals on the initial Appeal.

STATUS OF CLAIMS

No claims have been allowed. Claims 1-8 have been rejected under 35 USC 103(a) as obvious in view of various combinations of the references cited. The claims on appeal are reproduced in Claims Appendix.

STATUS OF AMENDMENTS

All proposed amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

This invention relates to golf clubs. More particularly, it relates to putters which are weighted and assembled with their components arranged so that the vertical center of mass of the entire putter assembly (head, shaft and grip) lies within the horizontal length of a defined preferred striking surface on the face of the putter head. Thus the mass of the putter is substantially balanced with respect to the vertical axis of the putter head.

The general structure of the putter of the invention is illustrated in the drawing as a putter which has a head 10, a shaft 20 and a grip 28. The head 10 defines a horizontal axis and has a bottom face 12, a top face 13 and a striking face 11 which extends in a substantially vertical plane from the bottom face 12 to the top face 13. The shaft 20 extends from the top face 13 of the head at an angle of about 8° to 25° from vertical. Grip 28 is positioned at the end of the shaft 20 opposite the head 10. As defined by Claim 1, the mass of the putter is substantially balanced about a vertical line extending through the horizontal mid-point of the putter head. The striking face 11 extends in a substantially vertical plane substantially parallel with the horizontal axis. A preferred striking area is positioned on said striking surface which extends approximately one inch in each direction horizontally from the horizontal mid-point of the putter head. The shaft 20 extends from the top face 13 at an angle of from about 8° to about 25° from vertical and is aligned so that the mass of the putter (including head 10, shaft 20 and grip 28) lies within the horizontal length of the defined preferred striking area. As more specifically defined in Claim 6, the shaft 20 extends from the top face 13 at a position between said horizontal mid-point and the toe end of the putter head 10.

The unique structure defined by the claims provides a putter assembly (including head, shaft and grip) in which the mass is uniformly balanced about the horizontal mid-point of the putter head even though the shaft is inclined about 8° to about 25° from vertical. Accordingly, when the putter is stroked in the desired pendulum motion with the player in the traditional stance, the tendency for the putter head to yaw is virtually eliminated, resulting in a uniform stroke motion in which the striking face of the putter remains perpendicular to the direction of travel throughout the entire swing. By maintaining the vertical center of mass substantially at the horizontal mid-point of the striking surface, unintentional yaw is reduced and the striking face remains perpendicular to the direction of travel throughout the entire swing.

The claimed subject matter of Claim 1 is:

A putter (See specification page 2, lines 1-9; page 3, lines 1-15; page 4, lines 9-14. See drawing Fig. 1) comprising a putter head 10 (See specification page 4, lines 15-21; page 5, lines 3-5; See drawing Fig. 1) having a first mass and defining a bottom face 12 (See specification page 4, lines 15-21), a top face 13 and a striking face 11 which defines a horizontal axis and which extends in a substantially vertical plane from the bottom face 12 toward the top face 13 and extends at least about four inches in a plane substantially parallel with the horizontal axis to define a preferred striking area 17 approximately centrally located on the striking face 11 and extending a distance of approximately one inch in each direction horizontally from the horizontal mid-point of the striking face 11 (See specification page 5, lines 6-18; page 6, lines 5-12); and a shaft 20 having a second mass and extending from the top face 13 of the putter at an angle of from about 8° to about 25° from vertical (See specification page 7, lines 3-14; See drawing Fig. 2) with respect to the horizontal axis supporting a grip 28 on the end

thereof remote from the putter head 10 and aligned so that the vertical center of mass of the putter lies within the horizontal length of the preferred striking area 17 (See drawing Figs 1-3; See specification page 6, lines 16-page 7; line 2; page 7, lines 15-180).

The claimed subject matter of Claim 6 is:

A putter (See specification page 2, lines 1-9; page 3, lines 1-15; page 4, lines 9-14. See drawing Fig. 1) comprising a putter head 10 (See specification page 4, lines 15-21; page 5, lines 3-5; See drawing Fig. 1) having a toe end, a heel end, a bottom face 12 (See specification page 4, lines 15-21), a top face 13 and a striking face 11 which defines a preferred striking area 17 approximately centrally located on the striking face 11 and extending approximately one inch in each direction horizontally from the horizontal midpoint of the striking face 11 (See specification page 5, lines 6-18; page 6, lines 5-12; See drawing Fig. 2); and a shaft 20 extending from the top face 13 of the putter head 10 at a position between the horizontal midpoint and the toe end at an angle of from about 8° to about 25° from vertical wherein the putter head and the shaft are arranged and weighted to align the vertical center of mass thereof within the horizontal length of the preferred striking area 17 (See drawing Figs 1-3; See specification page 6, lines 16 – page 7, lines 2; page 7, lines 10 – page 8, line 2).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-8 have been rejected under 35 USC 103(a) as obvious in view of various combinations of the cited references, the Examiner alleging:

“Claims 1-4, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitabayashi (JP 2003-117033) in view of Chandler, III (USPN 6152832).

Regarding claim 1-3, Kitabayashi discloses a putter having a putterhead having a first mass and defining a top face, bottom face, and striking face which defines a horizontal axis and which extends in a substantially vertical plane from the bottom face to the top face and extends in a plane parallel to the horizontal axis and defining a preferred striking area centrally located on the striking face and a shaft having a second mass extending from the top face at an angle of 23.5 degrees supporting a grip on the end thereof remote from the putter head. Kitabayashi offsets the shaft's mounting position in order to allow left and right-handed players to utilize the club head. It is unclear if Kitabayashi discloses the vertical center of mass lying within the preferred length of the striking area, though Kitabayashi shows the clubhead being symmetric about a vertical axis, having a shaft connected and extending between the toe end and midpoint, and having an angle of 23.5 degrees. Chandler, III discloses a putter having a putter head and a shaft with grip wherein the vertical center of mass lies within the preferred length of the striking area being that the center of mass of the putter head would naturally occur at the center of the putterhead and that the handle of the shaft is substantially aligned therewith (See Entire Document). One having ordinary skill in the art would have found it obvious to have the vertical center of mass within the preferred striking area, as taught by Chandler, III, in order to promote natural pendulum movement of the arm.

Regarding claim 4, Chandler, III shows a marker that identifies the midpoint of the putter head (See Figure 1).

Regarding claim 6, see the above regarding claim 1.

Regarding claim 7, Chandler, III also shows a marker on the top face in which the marker appears to be aligned with the center of mass of the putter (See Figures 1 and 2).

Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitabayashi in view of Chandler, III further in view of Redman.

Regarding claim 8, Kitabayashi in view of Chandler, III does not disclose the marker equally visible from both sides of the shaft. Redman shows the marker being equally visible on both side of the shaft. One having ordinary skill in the art would have found it obvious to have the marker of Kitabayashi in view of Chandler, III to be visible for both sides of the shaft, as taught by Redman, in order to align the golf ball with the club head.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Redman in view of Chandler, III (USPN 6152832).

Regarding claim 1, Redman discloses a putter having a putterhead having a first mass and defining a top face, bottom face, and striking face which

defines a horizontal axis and which extends in a substantially vertical plane from the bottom face to the top face and extends in a plane parallel to the horizontal axis and defining a preferred striking area centrally located on the striking face and a shaft having a second mass extending from the top face at an angle of 65 degrees (25 degrees from a vertical axis with respect to the horizontal axis) supporting a grip on the end thereof remote from the putter head. Redman offsets the shaft's mounting position in order to balance the weight of the club head. It is unclear if Redman discloses the vertical center of mass lying within the preferred length of the striking area. Chandler, III discloses a putter having a putter head and a shaft with grip wherein the vertical center of mass lies within the preferred length of the striking area being that the center of mass of the putter head would naturally occur at the center of the putterhead and that the handle of the shaft is substantially aligned therewith (See Entire Document). One having ordinary skill in the art would have found it obvious to have the vertical center of mass within the preferred striking area, as taught by Chandler, III, in order to reduce twisting and to promote natural pendulum movement of the arm."

ARGUMENT

In rejecting claims under 35 USC 103, the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992). Only if that burden is met does the burden of coming forward with argument or evidence shift to the applicant. A *prima facie* case of obviousness is established only when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 782, 26 USPQ 143,147 (CCPA 1976). If the Examiner fails to establish a *prima facie* case, the rejection is improper and must be overturned. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596,1598 (Fed. Cir. 1998). No such *prima facie* case has been presented in this case.

The invention claimed addresses the problem of induced yaw in movement of the putter head when the putter is moved through a pendulum swing 90° from the direction in which the player is facing to stroke the ball. Appellant's solution is constructing the putter so that the mass of the entire putter assembly (including head, shaft and grip) is uniformly balanced about the horizontal mid-point of the putter head with the shaft inclined at about 8° to about 25° from vertical to permit use of the normal traditional stance when putting. By maintaining the vertical center of mass substantially at the horizontal mid-point of the striking surface, the striking face remains perpendicular to the direction of putter head travel throughout the entire swing of the putter and unintentional yaw is reduced.

ISSUE A. Can the disclosures of Kitabayashi and Chandler be combined to form the invention defined by Claims 1-3 and 6?

Claim 1 (as well as Claims 2-5 dependent therefrom) defines a putter comprising:

(a) a putter head having a first mass and defining a bottom face, a top face and a striking face which defines a horizontal axis and which extends in a substantially vertical plane from said bottom face toward said top face and extends at least about four inches in a plane substantially parallel with said horizontal axis to define a preferred striking area approximately centrally located on said striking face and extending a distance of approximately one inch in each direction horizontally from the horizontal mid-point of said striking face; and

(b) a shaft having a second mass and extending from the top face of said putter at an angle of from about 8° to about 25° from vertical with respect to said horizontal axis supporting a grip on the end thereof remote from said putter head and aligned so that the vertical center of mass of the putter lies within the horizontal length of said preferred striking area.

Claim 6 defines the same putter in more specific language as comprising:

(a) a putter head having a toe end, a heel end, a bottom face, a top face and a striking face which defines a preferred striking area approximately centrally located on said striking face and extending approximately one inch in each direction horizontally from the horizontal midpoint of said striking face; and

(b) a shaft extending from said top face of said putter head at a position between said horizontal midpoint and said toe end at an angle of from about 8° to about 25° from vertical wherein said putter head and said shaft are arranged and weighted to align the vertical center of mass thereof within the horizontal length of said preferred striking area.

In rejecting Claims 1-3 and 6, the Examiner alleges that Kitabayashi discloses all the structure of Claims 1-3 and 6 excepting only the critical limitation of aligning the shaft and grip “so that the vertical center of mass of the [entire] putter lies within

the horizontal length of said preferred striking area.”¹ While admitting that Kitabayashi fails to disclose this critical limitation, the Examiner alleges that Chandler “discloses a putter having a putter head and a shaft with grip wherein the vertical center of mass lies within the preferred length of the striking area...” and concludes that “One having ordinary skill in the art would have found it obvious to have the vertical center of mass within the preferred striking area...”

It should first be noted that Kitabayashi discloses a unique “tri-planar grip” for a traditional mallet-type putter with the shaft inclined 23.5° from vertical so that the putter can be used in the traditional stance wherein the player faces 90° from the direction of swing. Chandler, on the other hand, discloses a putter wherein the shaft extends vertically from the putter head, thus requiring the player to use an unusual upright stance facing the direction of swing. This, of course, limits the Chandler putter to use with only one hand instead of the traditional two-handed grip.

Assuming (without admitting) that Kitabayashi discloses all the claimed structure except aligning the shaft, *etc.*, so that the center of mass is vertically aligned over the preferred striking area (as alleged by the Examiner), substitution of the vertically aligned shaft of Chandler for the inclined shaft of Kitabayashi is necessary to achieve the critical limitation of aligning the shaft and grip “so that the vertical center of mass of the [entire] putter lies within the horizontal length of the preferred striking area.” Such a combination, however, would produce a putter which fails to include another limitation specified, *i.e.*, “a shaft...extending from the top face of said putter at an angle of from about 8° to about 25° from vertical...” as required in Claims 1-3 and 6.

¹ In Claim 6, this limitation as recited as “wherein said putter head and said shaft are arranged and weighted to align the vertical center of mass thereof within the horizontal length of said preferred striking area.”

Kitabayashi discloses a club head supported on a shaft which is on the top surface toward the toe end (instead of the center or heel end) of the head. There is no discussion or recognition of any of the characteristics or limitations set forth in Claims 1-3 and 6. Instead, there is simply a picture of a traditional mallet-type putter. The Examiner's admission that "It is unclear if Kitabayashi discloses the vertical center of mass lying with the preferred length of the striking area" is a less than candid appraisal of Kitabayashi. Kitabayashi does not even describe (or recognize) a "preferred striking area" or disclose any limitation which would locate the center of mass within such a preferred striking area. Instead, Kitabayashi merely discloses a grip which can be rotated 360° to permit right-hand or left-hand use. Nothing in Kitabayashi discloses or suggests that the components of the putter must be arranged so that the *vertical center of mass* of the entire putter lies within the horizontal length of the preferred striking area.

To provide the admitted deficiencies of Kitabayashi, the Examiner attempts to combine the disclosure of Chandler, alleging that the one-handed croquet-style putter of Chandler inherently positions the center of mass of the entire putter within the preferred striking area (because the Chandler shaft projects vertically from the horizontal center of the putter head face) and thus it would be obvious to position the shaft at the vertical center of mass.

Assuming that the vertical displacement of the Chandler shaft results in positioning the vertical center of mass within the (undefined) preferred striking area of the putter head face, this structure alone *precludes* combining the disclosure of Chandler with the disclosure of Kitabayashi to support an obviousness rejection under §103. All of Appellant's claims specifically require that the shaft extend from the

putter head top surface at an angle of from about 8° to about 25° from vertical.² Chandler specifically requires the shaft to extend vertically above the geometric center of the putter head. Therefore, it would be impossible to combine any structure or teaching found in Chandler with the disclosure of Kitabayashi to produce a putter in which the shaft extends from the putter head at an angle of from about 8° to about 25° and in which the vertical center of mass of the *entire putter* (including shaft and grip) lies within the preferred striking area. The stated reason for aligning the Chandler shaft vertically is to permit use of a one-handed upright and forward facing stance. Thus, incorporating the vertically arranged shaft structure of Chandler would destroy the mode of operation of the Kitabayashi putter.

As stated in *National Tractor Pullers Assn., Inc. v. Watkins*, 205 USPQ 892 at 911:

"Modification of a prior art patent or device which would render that device unworkable for its intended purpose cannot be said to suggest such a modification."

The Kitabayashi putter is obviously designed and intended to be used with the player in a traditional two-handed stance facing 90° from the direction of putter head swing. Furthermore, Chandler expressly arranges his putter structure to require that the shaft extends vertically so that the putter must be used only in the unorthodox upright forward-facing stance while gripped with only one hand.

Appellant's putter is designed only for use in the traditional two-handed stance with the player facing 90° from the line of putter head travel. Not only would the combination suggested by the Examiner destroy the mode of operation of the primary reference, it would require the redesigned putter to function in an entirely different

² Inclination of the shaft from vertical is, of course, necessary to permit use of the putter in the traditional two-handed stance with the player facing 90° from the direction of swing.

manner. Accordingly, the modification of Kitabayashi suggested by the Examiner cannot be used to support a rejection under 35 USC 103.

ISSUE B. Is there any teaching, suggestion or motivation found in either Kitabayashi or Chandler to combine individual components of the references to produce the invention of Claims 1-3 and 6?

For determining obviousness, Sec. 103 specifically requires that the claim be considered “as a whole”, including its structure, its properties and the problems it solves. See *In re Wright*, 848 F.2d 1216, 1219, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988); *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1987 (Fed. Cir. 1990). Inventions typically are new combinations of existing principles or features. *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that “virtually all [inventions] are combinations of old elements.”) As expressed in *Ruiz v. A. B. Chance Co.*, 357 F. 3rd 1270, 69 USQ 2d 1686 (Fed. Cir. 2004):

“The ‘as a whole’ instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result – often the very definition of invention.”

Sec. 103 further requires cognizance of not only the structure and properties of the invention but also the problems it solves. *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). It is error to focus solely on the product created rather than on the obviousness or non-obviousness of its *creation*. Therefore, "the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to

solve the problem on which the inventor was working." *In re Wright*, 848 F.2d at 1219, 6 USPQ2d at 1961.

There can be no doubt that Kitabayashi is not concerned with the problem of induced yaw. Instead, Kitabayashi merely describes a rotatable grip so that the putter can be used by left-handed or right-handed players. No reason for or motivation to align the shaft to achieve a vertically mass balanced putter is even remotely suggested.

Chandler, on the other hand, recognizes the yaw problem but addresses it in an entirely different and unique manner. Chandler aligns the shaft vertically, thus (apparently) achieving a vertically mass balanced putter. However, because of the vertical alignment of the Chandler shaft, the putter cannot be used in the traditional two-handed 90° stance. Thus, while Chandler recognizes the problem addressed by Appellant, Chandler's solution cannot be applied to traditional putters. Appellant's unique solution solves both problems – a vertically mass balanced putter which can be used in the traditional stance.

Most significantly, nothing in either reference suggests that the Examiner's modifications could be made or that the modifications would produce the novel results of the claimed structure. As explained in *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, (Fed. Cir. 1998):

[T]he legal conclusion of obviousness requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of skill would have selected the components that the inventor selected and used them to make the new device.

The modification suggested by the Examiner, however, is only apparent from the teachings of the present invention and the Examiner's modified structure becomes obvious only after referring to the desired structure described and claimed by Appellant.

It is well settled that when "prior art references require the selective combination...to render obvious a subsequent invention, there must be some reason for the combination other than hindsight gleaned from the invention itself." *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). *See also ACS Hospital System, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Associates v. Garlock*, 721 F.2d 1540, 1553, 220 USPQ 312-13 (Fed. Cir. 1983).

Obviousness under §103 cannot be established by modifying the prior art to produce the invention absent some teaching, suggestion or incentive supporting such combination or modification. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990) (quoting from *Carella v. Starlight Archery*, 231 USPQ 644 (Fed. Cir. 1986)). Furthermore, the references can only be considered for what they teach one skilled in the art. *In re Soderquist*, 140 USPQ 387 (CCPA 1964); *In re Richman*, 165 USPQ 509 (CCPA 1970). The rejection here is not based on any disclosure of structure as specified in the rejected claim nor is the rejection based on a showing that the Examiner's combination would solve the problems solved by the claimed invention. Instead, the rejection is based solely on the Examiner's unsupported supposition that the references may be modified *merely for expedience*. However, as stated in *In re Bond*:

The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

No such teaching can be found in either of the references. The Examiner has merely assumed that since the claimed structure appears simple, it would be obvious to modify

other apparently simple structures to produce the claimed invention with no basis therefor other than Appellant's disclosure. While the claimed structure may appear simple in hindsight, its *creation* was neither simple nor obvious. As noted in *In re Horn, Horn, Horn and Horn*, 203 USPQ 969 at 971 (CCPA 1979):

[S]implicity and hindsight are not proper criteria for resolving the issues of obviousness.

The absence of a suggestion to combine is telling in an obviousness determination. In *Motorola, Inc. v. Interdigital Technology Corp.*, 125 F.3d 1461, 43 USPQ 2d 1481 (Fed. Cir. 1997) the court stated:

Although...[the disclosure requirement]...presupposes the knowledge of one skilled in the art of the claimed invention, that presumed knowledge does not grant a license to read into the prior art references teachings that are not there.

The present obviousness rejection is based solely on the Examiner's assumptions of that inclined but vertically mass balanced shafts could be substituted for non-vertically mass balanced shafts because Chandler shows a vertically aligned shaft. Simply stated, the rejection is based on the Examiner's unsubstantiated assumption instead of teachings found in the art. The sole basis for making such assumption is the Examiner's belief that the prior art could be modified to produce the invention even though there is no such teaching or suggestion in the art. However, "[T]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Laskowski*, 871 F.2d 115, 10 USPQ 1397 (Fed. Cir. 1989). Nowhere does the Examiner even allege that any of the references remotely suggests the desirability of the modifications suggested. Instead, the Examiner finds a vertical shaft (which he thinks would provide the missing vertical mass balancing) and, as expressly prohibited by *Ruiz v. A. B. Chance* and without any

suggestion or teaching found in the references, “on that basis alone declares the invention obvious.”

Since the vertical shaft of Chandler is incapable of being inclined 8° to 25° as required by Claims 1-3 and 6, nothing in Chandler can suggest modification of Kitabayashi to produce a vertically mass balanced putter as claimed.

ISSUE C. Can the disclosures of Kitabayashi, Chandler or Redman be combined to form the invention defined by Claims 4-5 and 7-8?

Claims 4 and 5 are dependent from Claim 3 which is dependent from Claim 1 and include the further limitation that the putter head “includes a marker on the top face thereof which identifies the horizontal midpoint of said striking face.”

Claims 7 and 8 are dependent from Claim 6 and include the further limitation that that putter head “includes a marker on the top face thereof which identifies the horizontal center of mass of said putter.”

In rejecting Claims 4-5 and 7-8 the Examiner relies on the same combination of references applied in the same manner as applied in rejecting Claims 1-3 and 6. However, the Examiner further alleges that Chandler “shows a marker that identifies the midpoint of the putter head” and that “it would be obvious to have the marker of Kitabayashi in view of Chandler to be visible for both sides of the shaft, as taught by Redman...”

Since the rejection of Claims 4-5 and 7-8 is identical to the rejection of Claims 1-3 and 6 (except for the “marker” allegations) the arguments advanced above regarding Claims 1-3 and 6 (see **Issue A**, above) are equally applicable to these claims and need not be repeated in detail here. However, since Claims 4-5 and 7-8 require a specific element not included in Claims 1-3 and 6, they must be considered as new combinations of components, all of which cooperate to produce a specific structure

which cannot be produced using the components selected from the references applied by the Examiner. Each of the arguments regarding non-obviousness advanced in **Issue A** above apply equally to this new combination of elements.

It should first be noted that in Claim 4 the marker identifies the horizontal midpoint of the striking face defined in Claim 1. No such defined striking face is disclosed or described in either Kitabayashi, Chandler or Redman. In fact, the Examiner notes that the marker in Chandler “identifies the midpoint of the putter head,” not the horizontal midpoint of the striking face. This distinction is crucial to the structure claimed. In Claim 4 (ultimately dependent from Claim 1), the vertical center of mass of the entire putter lies within the horizontal length of the preferred striking area. Thus the marker identifies the vertical center of mass of the entire putter assembly. Identifying “the midpoint of the putter head” is irrelevant to the invention. Thus, using Chandler’s marker to identify the “midpoint of the putter head” cannot be used with the Kitabayashi reference to identify the horizontal midpoint of the striking face as carefully defined by Claim 4.

In rejecting Claim 7, the Examiner further alleges that the Chandler marker “*appears* (emphasis added) to be aligned with the center of mass of the putter.” Significantly, the Examiner uses the word “appears” since nothing in either reference directly or indirectly discloses the relationship of the marker to the center of mass. In fact, the location of the center of mass (of either the putter head or the entire putter) is not disclosed. Since the center of mass is not disclosed, the relationship of the center of mass and the marker is not disclosed. Furthermore, nothing in either reference suggests any relationship between center of mass and the marker. Accordingly, there is no way to combine the disclosures of Kitabayashi and Chandler to produce the specific structure claimed.

Redman discloses a blade-type club in which the shaft is attached at the toe end of the club head and inclined toward the player. Markers extend across the top face of the club head which are used in connection with the shaft to provide a “sighting element” to keep the blade aligned 90° from the direction of swing. Nothing in Redman discloses, discusses or in any way refers to balancing the putter to avoid induced yaw. Furthermore, if the vertical shaft of Chandler is used on the mallet-type putter of Kitabayashi (as suggested by the Examiner), the “sighting element” of Redman would be inoperable because the Redman “sighting element” must cooperate with an inclined shaft. Accordingly, there is no way in which the elements of Kitabayashi, Chandler and Redman can be combined to produce the invention claimed.

ISSUE D. Is there any teaching, suggestion or motivation found in either Kitabayashi, Chandler or Redman to combine individual components of the references to produce the invention of Claims 4-5 and 7-8?

Claims 4 and 5 are dependent from Claim 3 which is dependent from Claim 1 and include the further limitation that the putter head “includes a marker on the top face thereof which identifies the horizontal midpoint of said striking face.”

Claims 7 and 8 are dependent from Claim 6 and include the further limitation that that putter head “includes a marker on the top face thereof which identifies the horizontal center of mass of said putter.”

In rejecting Claims 4-5 and 7-8 the Examiner relies on the same combination of references applied in the same manner as applied in rejecting Claims 1-3 and 6. However, the Examiner further alleges that Chandler “shows a marker that identifies the midpoint of the putter head.”

Since the rejection of Claims 4-5 and 7-8 is identical to the rejection of Claims 1-3 and 6 (except for the “marker” allegations) the arguments advanced above

regarding Claims 1-3 and 6 (see **Issue B**, above) are equally applicable to these claims and need not be repeated in detail here. However, since Claims 4-5 and 7-8 require a specific element not included in Claims 1-3 and 6, they must be considered as new combinations of components, all of which cooperate to produce a specific structure which cannot be produced using the components selected from the references applied by the Examiner. Each of the arguments regarding non-obviousness advanced in **Issue B** above apply equally to this new combination of elements.

It should be noted that in Claim 4 the marker identifies the horizontal midpoint of the striking face defined in Claim 1. No such defined striking face is disclosed or described in either Kitabayashi or Chandler. In fact, the Examiner notes that the marker in Chandler “identifies the midpoint of the putter head,” not the horizontal midpoint of the *striking face*. This distinction is crucial to the structure claimed. In Claim 4 (ultimately dependent from Claim 1), the vertical center of mass of the entire putter lies within the horizontal length of the preferred striking area. Thus the marker identifies the vertical center of mass of the entire putter assembly. Identifying “the midpoint of the putter head” is irrelevant to the invention. Thus, using Chandler’s marker to identify the “midpoint of the putter head” cannot be used with the Kitabayashi reference to identify the horizontal midpoint of the striking face as carefully defined by Claim 4.

In rejecting Claim 7, the Examiner further alleges that the Chandler marker “*appears* (emphasis added) to be aligned with the center of mass of the putter.” Obviously, the Examiner uses the word “appears” since nothing in either reference directly or indirectly discloses the relationship of the marker to the center of mass. In fact, the location of the center of mass (of either the putter head or the entire putter) is not disclosed. Since the center of mass is not disclosed, the relationship of the center of

mass and the marker is not disclosed. Furthermore, nothing in either reference suggests any relationship between center of mass and the marker. Accordingly, there can be no suggestion, teaching or motivation found in Kitabayashi or Chandler to combine the specific features which the Examiner attempts to combine to produce the claimed invention.

Redman discloses a blade-type club in which the shaft is attached at the toe end of the club head and inclined toward the player. Markers extend across the top face of the club head which are used in connection with the shaft to provide a “sighting element” to keep the blade aligned 90° from the direction of swing. Nothing in Redman discloses, discusses or in any way refers to balancing the putter to avoid induced yaw. Furthermore, if the vertical shaft of Chandler is used on the mallet-type putter of Kitabayashi (as suggested by the Examiner), the “sighting element” of Redman would be inoperable because the Redman “sighting element” requires and must cooperate with an inclined shaft. Since neither Redman nor Kitabayashi disclose or suggest means for eliminating induced yaw, and since Chandler avoids induced yaw by extending the shaft vertically, nothing found in any of these references would suggest combining unrelated elements to produce the invention claimed. Accordingly, there is no suggestion, teaching or motivation to combine the elements of Kitabayashi, Chandler and Redman as suggested by the Examiner.

ISSUE E. Can the disclosures of Redman and Chandler be combined to form the invention defined by Claim 1?

Claim 1 defines a putter comprising:

(a) a putter head having a first mass and defining a bottom face, a top face and a striking face which defines a horizontal axis and which extends in a substantially vertical plane from said bottom face toward said top face and extends at

least about four inches in a plane substantially parallel with said horizontal axis to define a preferred striking area approximately centrally located on said striking face and extending a distance of approximately one inch in each direction horizontally from the horizontal mid-point of said striking face; and

(b) a shaft having a second mass and extending from the top face of said putter at an angle of from about 8° to about 25° from vertical with respect to said horizontal axis supporting a grip on the end thereof remote from said putter head and aligned so that the vertical center of mass of the putter lies within the horizontal length of said preferred striking area.

In rejecting Claim 1, the Examiner alleges that Redman discloses all the structure of Claim 1 excepting only the critical limitation of aligning the shaft and grip “so that the vertical center of mass of the [entire] putter lies within the horizontal length of said preferred striking area.” While admitting that Redman fails to disclose this critical limitation, the Examiner alleges that Chandler “discloses a putter having a putter head and a shaft with grip wherein the vertical center of mass lies within the preferred length of the striking area...” and concludes that “One having ordinary skill in the art would have found it obvious to have the vertical center of mass within the preferred striking area...”

It should first be noted that Redman discloses a traditional blade-type club with an inclined shaft which can be used in the traditional stance wherein the player faces 90° from the direction of swing. The shaft, however, is attached at the toe end of the club head and markers on the top face of the club head are used in connection with the shaft as “sighting elements” to keep the club face aligned normal to the direction of swing. Chandler, on the other hand, discloses a putter where the shaft extends vertically from the putter head, thus requiring the player to use an unusual upright

stance facing the direction of swing. This, of course, limits the Chandler putter to use with only one hand instead of the traditional two-handed grip.

Assuming (without admitting) that Redman discloses all the claimed structure except aligning the shaft, *etc.*, so that the center of mass is vertically aligned over the preferred striking area (as alleged by the Examiner), substitution of the vertically aligned shaft of Chandler for the inclined shaft of Redman is necessary to achieve the critical limitation of aligning the shaft and grip “so that the vertical center of mass of the [entire] putter lies within the horizontal length of the preferred striking area.” Such a combination, however, would produce a putter which fails to include another critical limitation specified, *i.e.*, “a shaft...extending from the top face of said putter at an angle of from about 8° to about 25° from vertical...” as required in Claim 1.

Redman discloses a club head supported on a shaft which is attached at the toe end (instead of the center or heel end) of the head. There is no discussion or recognition of any of the characteristics or limitations set forth in Claim 1. The Examiner’s admission that “It is unclear if Redman discloses the vertical center of mass lying with the preferred length of the striking area” is a less than candid appraisal of Redman. Redman does not even describe (or recognize) a “preferred striking area” or disclose any limitation which would locate the center of mass within such a preferred striking area. Instead, Redman merely discloses a shaft attached to the toe end so that the shaft may cooperate with the “sighting elements” to control the face of the blade. Nothing in Redman discloses or suggests that the components of the putter must be arranged so that the *vertical center of mass* of the entire putter lies within the horizontal length of a preferred striking area.

To provide the admitted deficiencies of Redman, the Examiner attempts to combine the disclosure of Chandler, alleging that the one-handed croquet-style putter of

Chandler inherently positions the center of mass of the entire putter within the preferred striking area (because the Chandler shaft projects vertically from the horizontal center of the putter head face) and thus it would be obvious to position the shaft at the vertical center of mass.

Assuming that the vertical displacement of the Chandler shaft results in positioning the vertical center of mass within the (undefined) preferred striking area of the putter head face, this structure alone *precludes* combining the disclosure of Chandler with the disclosure of Redman to support an obviousness rejection under §103. Claim 1 specifically requires that the shaft extend from the putter head top surface at an angle of from about 8° to about 25° from vertical. Chandler specifically requires the shaft to extend vertically above the geometric center of the putter head. Therefore, it would be impossible to combine any structure or teaching found in Chandler with the disclosure of Redman to produce a putter in which the shaft extends from the putter head at an angle of from about 8° to about 25° and in which the vertical center of mass of the *entire putter* (including shaft and grip) lies within the preferred striking area. The stated reason for aligning the Chandler shaft vertically is to permit use of a one-handed upright and forward facing stance. Thus, incorporating the vertically arranged shaft structure of Chandler would destroy the mode of operation of the Redman club.

As stated in *National Tractor Pullers Assn., Inc. v. Watkins*, 205 USPQ 892 at 911:

"Modification of a prior art patent or device which would render that device unworkable for its intended purpose cannot be said to suggest such a modification."

The Redman club is obviously designed and intended to be used with the player in the traditional two-handed stance facing 90° from the direction of putter head swing.

Chandler, however, expressly arranges his putter structure to require that the shaft extends vertically so that the putter can only be used in the unorthodox upright forward-facing stance while gripped with only one hand.

Appellant's putter is designed only for use in the traditional two-handed stance with the player facing 90° to the line of putter head travel. Not only would the combination suggested by the Examiner destroy the mode of operation of the primary reference, it would require the redesigned club to function in an entirely different manner. Accordingly, the modification of Redman suggested by the Examiner cannot be used to support a rejection under 35 USC 103.

ISSUE F. Is there any teaching, suggestion or motivation found in either Redman or Chandler to combine individual components of the references to produce the invention of Claim 1?

For determining obviousness, Sec. 103 specifically requires that the claim be considered "as a whole", including its structure, its properties and the problems it solves. See *In re Wright*, 848 F.2d 1216, 1219, 6 USPQ2d 1959, 1961 (Fed. Cir. 1988); *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1987 (Fed. Cir. 1990). Inventions typically are new combinations of existing principles or features. *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that "virtually all [inventions] are combinations of old elements.") As expressed in *Ruiz v. A. B. Chance Co.*, 357 F. 3rd 1270, 69 USQ 2d 1686 (Fed. Cir. 2004):

"The 'as a whole' instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result – often the very definition of invention."

Sec. 103 further requires cognizance of not only the structure and properties of the invention but also the problems it solves. *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). It is error to focus solely on the product created rather than on the obviousness or non-obviousness of its *creation*. Therefore, "the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to solve the problem on which the inventor was working." *In re Wright*, 848 F.2d at 1219, 6 USPQ2d at 1961.

There can be no doubt that Redman does not recognize or address the problem of induced yaw resulting from putter imbalance. Instead, Redman positions the shaft at the toe so that the player can visually align the club to prevent yaw. No reason for or motivation to align the shaft to achieve a vertically mass balanced putter is even remotely suggested.

Chandler, on the other hand, recognizes the yaw problem but addresses it in an entirely different and unique manner. Chandler aligns the shaft vertically, thus (apparently) achieving a vertically mass balanced putter. However, because of the vertical alignment of the Chandler shaft, the putter cannot be used in the traditional two-handed 90° stance. Thus, while Chandler recognizes the problem addressed by Appellant, Chandler's solution cannot be applied to traditional putters. Appellant's unique solution solves both problems – a vertically mass balanced putter which can be used in the traditional stance.

Most significantly, nothing in either reference suggests that the Examiner's modifications could be made or that the modifications would produce the novel results of the claimed structure. As explained in *C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, (Fed. Cir. 1998):

[T]he legal conclusion of obviousness requires that there be some suggestion, motivation, or teaching in the prior art whereby the person of skill would have selected the components that the inventor selected and used them to make the new device.

The modification suggested by the Examiner, however, is only apparent from the teachings of the present invention and the Examiner's modified structure becomes obvious only after referring to the desired structure described and claimed by Appellant.

It is well settled that when "prior art references require the selective combination...to render obvious a subsequent invention, there must be some reason for the combination other than hindsight gleaned from the invention itself." *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). *See also ACS Hospital System, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W.L. Gore & Associates v. Garlock*, 721 F.2d 1540, 1553, 220 USPQ 312-13 (Fed. Cir. 1983).

Obviousness under §103 cannot be established by modifying the prior art to produce the invention absent some teaching, suggestion or incentive supporting such combination or modification. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990) (quoting from *Carella v. Starlight Archery*, 231 USPQ 644 (Fed. Cir. 1986)). Furthermore, the references can only be considered for what they teach one skilled in the art. *In re Soderquist*, 140 USPQ 387 (CCPA 1964); *In re Richman*, 165 USPQ 509 (CCPA 1970). The rejection here is not based on any disclosure of structure as specified in the rejected claim nor is the rejection based on a showing that the Examiner's combination

would solve the problems solved by the claimed invention. Instead, the rejection is based solely on the Examiner's unsupported supposition that the references may be modified *merely for expedience*. However, as stated in *In re Bond*:

The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

No such teaching can be found in either of the references. The Examiner has merely assumed that since the claimed structure appears simple, it would be obvious to modify other apparently simple structures to produce the claimed invention with no basis therefor other than Appellant's disclosure. While the claimed structure may appear simple in hindsight, its *creation* was neither simple nor obvious. As noted in *In re Horn, Horn, Horn and Horn*, 203 USPQ 969 at 971 (CCPA 1979):

[S]implicity and hindsight are not proper criteria for resolving the issues of obviousness.

The absence of a suggestion to combine is telling in an obviousness determination. In *Motorola, Inc. v. Interdigital Technology Corp.*, 125 F.3d 1461, 43 USPQ 2d 1481 (Fed. Cir. 1997) the court stated:

Although...[the disclosure requirement]...presupposes the knowledge of one skilled in the art of the claimed invention, that presumed knowledge does not grant a license to read into the prior art references teachings that are not there.

The present obviousness rejections are based solely on the Examiner's assumptions of that inclined but vertically mass balanced shafts could be substituted for non-vertically mass balanced shafts because Chandler shows a vertically aligned shaft. Simply stated, the rejections are based on the Examiner's unsubstantiated assumption instead of teachings found in the art. The sole basis for making such assumption is the Examiner's belief that the prior art could be modified to produce the invention even though there is no such teaching or suggestion in the art. However, "[T]he mere fact that prior art could be so modified would not have made the modification obvious

unless the prior art suggested the desirability of the modification." *In re Laskowski*, 871 F.2d 115, 10 USPQ 1397 (Fed. Cir. 1989). Nowhere does the Examiner even allege that any of the references remotely suggests the desirability of the modifications suggested. Instead, the Examiner finds a vertical shaft (which he thinks would provide the missing vertical mass balancing) and, as expressly prohibited by *Ruiz v. A. B. Chance* and without any suggestion or teaching found in the references, "on that basis alone declares the invention obvious."

Since the vertical shaft of Chandler is incapable of being inclined 8° to 25° as required by Claim 1, nothing in Chandler can suggest modification of Redman to produce a vertically mass balanced putter as claimed.

The ultimate question in a rejection for obviousness is what the references teach one skilled in the art. *In re Soderquist*, 140 USPQ 387 (CCPA 1964); *In re Richman*, 165 USPQ 509 (CCPA 1970). Even if a prior art device could be modified to produce the claimed invention, an obviousness rejection is not appropriate unless the prior art suggests the desirability of the modification. *In re Gordon, et al.*, 221 USPQ 1125 (Fed. Cir. 1984); *In re Laskowski*, 10 USPQ2d 1397 (Fed. Cir. 1989). It is impermissible to simply engage in hindsight reconstruction of the claimed invention using the applicant's structure as a template and selecting elements from the references to fill the gaps. *Interconnect Planning Corp., v. Fiel, et al.*, 774 F.2d 1132, 227 USPQ 543 (Fed. Cir. 1985).

It is axiomatic that the test for obviousness is what the combined teachings of the prior art would have suggested to one of ordinary skill in the art. See, for example *Merck & Co., Inc. v. Biocraft Laboratories, Inc.*, 10 USPQ2d 1843 (Fed. Cir. 1989) and *In re Keller, Terry and Davies*, 208 USPQ 871 (CCPA 1981). Considering the references cited herein for what they fairly disclose, there is simply nothing which

teaches or even remotely suggests the specific structure claimed or any reason for making such structure. Even if the prior art could be modified to produce the claimed structure, an obviousness rejection is not appropriate unless the prior art suggests the desirability of the modification. *In re Gordon, et al.*, 221 USPQ 1125 (Fed. Cir. 1984); *In re Laskowski*, 10 USPQ2d 1397 (Fed. Cir. 1989). Nothing in the references cited even remotely suggests that such structures would be useful or desirable if they could be fabricated. As succinctly stated in *Ex parte Clapp*, 227 USPQ 972 at 973:

To support the conclusion that the claimed combination is directed to obvious subject matter, either the reference must expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

Neither of these requirements has been met in this case.

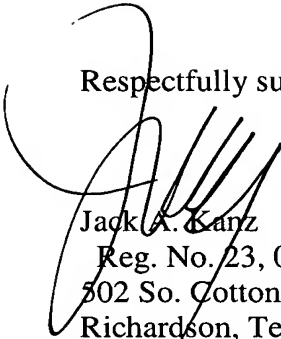
Since the novel features specifically defined in the claims are not disclosed in the references; since the various features found in the references cannot be combined as suggested by the Examiner to produce the invention claimed; and since there is nothing in any of the references to suggest or teach the combination alleged by the Examiner, it is respectfully submitted that the Sec. 103 rejections of Claims 1-8 are wholly unsupportable and must be reversed.

CONCLUSION

Appellant submits that Claims 1-8 have been erroneously rejected for the reasons set forth hereinabove. Accordingly, reversal of all rejections is respectfully requested.

Our check in the amount of \$250.00 to cover the fee required by 37 CFR 41.20(b) for filing this Brief on Appeal was submitted with the original Brief on Appeal filed September 15, 2005.

Respectfully submitted,



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June 20, 2007

ATTORNEY FOR APPELLANT

CLAIMS APPENDIX**WHAT IS CLAIMED:**

1. A putter comprising:
 - (a) a putter head having a first mass and defining a bottom face, a top face and a striking face which defines a horizontal axis and which extends in a substantially vertical plane from said bottom face toward said top face and extends at least about four inches in a plane substantially parallel with said horizontal axis to define a preferred striking area approximately centrally located on said striking face and extending a distance of approximately one inch in each direction horizontally from the horizontal mid-point of said striking face; and
 - (b) a shaft having a second mass and extending from the top face of said putter at an angle of from about 8° to about 25° from vertical with respect to said horizontal axis supporting a grip on the end thereof remote from said putter head and aligned so that the vertical center of mass of the putter lies within the horizontal length of said preferred striking area.
2. A putter as defined in Claim 1 wherein said putter head is geometrically symmetrical about its vertical axis.
3. A putter head as defined in Claim 2 wherein said shaft extends from said top face at a point between the toe end of said putter head and the vertical axis of said putter head.

4. A putter as defined in Claim 3 wherein said putter head includes a marker on said top face thereof which identifies the horizontal midpoint of said striking face.

5. A putter as defined in Claim 4 wherein said marker extends in opposite directions from the geometric center of said putter head.

6. A putter comprising:

(a) a putter head having a toe end, a heel end, a bottom face, a top face and a striking face which defines a preferred striking area approximately centrally located on said striking face and extending approximately one inch in each direction horizontally from the horizontal midpoint of said striking face;

(b) a shaft extending from said top face of said putter head at a position between said horizontal midpoint and said toe end at an angle of from about 8° to about 25° from vertical wherein said putter head and said shaft are arranged and weighted to align the vertical center of mass thereof within the horizontal length of said preferred striking area.

7. A putter as defined in Claim 6 wherein said putter head includes a marker on the top face thereof which identifies the horizontal center of mass of said putter.

8. A putter as defined in Claim 7 wherein said marker is equally visible on opposite sides of said shaft when the marker is aligned with a ball to be struck and said striking face is aligned perpendicular to the desired direction of travel of said ball.

EVIDENCE APPENDIX

The following references are relied on by the Examiner:

Kitabayashi	JP 2003-117033
Chandler II	USPN 6,152,832
Redman	USPN 1,631,504

These references were cited in the (second) Final Rejection dated "11/21/2006" at pages 2 and 3 as required by 37 CFR 41.37(c)(1)(ix), copies are attached.

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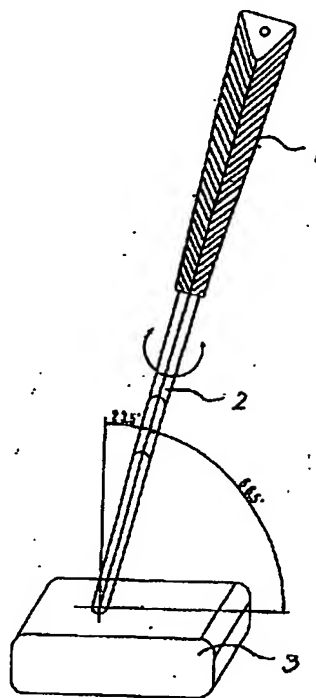
Fターム (参考) 2C002 AA04 AA06 AA07 GG01

(54) 【発明の名称】 三平面グリップを有する左右両打ち可能なアクシスパター

(57) 【要約】

【課題】 水平断面が三角形の三平面グリップを備え、バター軸傾が地球自転軸傾である23.5°の角度をもって傾斜し、しかもヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角度位置に固定して使用する左右両打ち可能なアクシスパターを提供することを課題とする。

【解決手段】 本発明項は、バター軸の一端部に水平断面が三角形の三平面グリップを備え、そのバター軸の他端部はヘッドに固定され、バター軸はヘッドの水平上面から上方へ伸びる垂直線に対して23.5°の角度をもって傾斜し、しかも前記ヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角度位置に固定して使用する左右両打ち可能なアクシスパターである。



【特許請求の範囲】

【請求項1】バター軸の一端部に水平断面が三角形の三平面グリップを備え、そのバター軸の他端部にはヘッドに固定され、バター軸はヘッドの水平上面から上方へ伸びる垂直線に対して23.5°の角度をもって傾斜し、しかも前記ヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角度位置に固定して使用する左右両打ち可能なアクシスパター。

【請求項2】バター軸の先端部に雄ねじを切り、そこに雌ねじ付き締めナット及び先端ナットを螺合させてダブルナット構造にし、これらナットは外側に雄ねじを有し、23.5°の角度をもって傾斜したナット付きバター軸の先端部をねじ込むねじ穴をヘッドに設け、このねじ穴にナット付きバター軸の先端部をねじ込み、三角形の三平面グリップを所望の角度に位置づけて後、締めナットを締めつけ固定することによりバター軸をヘッドに固定してなる請求項1記載の左右両打ち可能なアクシスパター。

【請求項3】バター軸の先端部以外の所望位置にダブルナット構造を備えてなる請求項1記載の左右両打ち可能なアクシスパター。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明はゴルフクラブのバターに関し、特に、水平断面が三角形の三平面グリップを備え、バター軸傾が地球自転軸傾である23.5°の角度をもって傾斜し、しかもヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角度位置に固定して使用する左右両打ち可能なアクシスパターに関する。

【0002】

【従来の技術】従来のゴルフクラブのバターは、バター軸とヘッドが一体化されているので、ひと度バターを購入すれば、グリップのにぎり心地を最適化して打ち易くするために、時と場合によってはにぎりを変化させたい時もあるが、それは望みようもなかった。まして、グリップをヘッドに対して回転させることなど考えられなかった。

【0003】

【発明が解決しようとする課題】そこで、手の親指と他の4本の指とでグリップをにぎるのであるが、親指で平面を押さえ、他の4本の指で稜線をにぎったり、或いは親指で1本の稜線を押さえ、他の4本の指で平面をにぎったり、時と場合によってにぎりを変化させることができるように水平断面を正三角形にした三平面をもつグリップにすることを本発明の第1の課題とする。また、上述と同じく時と場合によってにぎりを変化させることによってグリップのにぎり心地を最適化するために、ダブルナット構造によりヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角

度位置に固定して後に使用するアクシスパターを提供することを本発明の第2の課題とする。ダブルナット構造をバター軸の先端部に、或いは先端部以外のバター軸の所望位置に備えることを本発明の第3の課題とする。また、バターの軸傾を地球自転軸傾と同じく23.5°の角度にすることを本発明の第4の課題とする。プレー時、球を打つヘッド部分には相対する二つの同じ平面を設けることにより、左右両打ちを可能にすることを第5の課題とする。

【0004】

【課題を解決するための手段】本発明項は、バター軸の一端部に水平断面が三角形の三平面グリップを備え、そのバター軸の他端部はヘッドに固定され、バター軸はヘッドの水平上面から上方へ伸びる垂直線に対して23.5°の角度をもって傾斜し、しかも前記ヘッドに対して三角形の三平面グリップを360°回転可能にし、そのグリップを所望の角度位置に固定して使用する左右両打ち可能なアクシスパターである。

【0005】

【作用】本発明のアクシスパターは、バターの軸傾を地球自転軸傾と同じく23.5°の角度にしたことを表現するために英語の「AXIS PUTTER」から「アクシスパター」と命名したものである。バター軸2の先端部に雄ねじを切り、そこに雌ねじ付き締めナット5及び先端ナット4を嵌め螺合させてダブルナット構造にし、23.5°の角度をもって傾斜したナット付きバター軸2の先端部をヘッド3に形成したねじ穴6にねじ込む。先端ナット4は内側の雌ねじとバター軸2の雄ねじとの螺合によりバター軸2の先端部に固定され、一体化されている。バター軸2の反対端部は、正三角形の三平面グリップ1のバター軸穴7に挿入固定されているので、正三角形の三平面グリップ1をバター軸2とともにヘッド3に対して回転移動させ所望の角度に位置づけ、その後、緩めていた締めナット5を締めつけることによってバター軸2をヘッド3に固定することができる。プレー中はこの固定状態を保持することになる。球を打つヘッド部分には相対する二つの同じ平面を設けているので左右両打ちが可能である。ダブルナット構造をバター軸の先端部以外の所望位置に、例えば、バター軸のヘッドとの取り付け部とグリップ1との中間部、或いはグリップ1に近い位置に設けることもできる。

【0006】

【実施例1】図1に示すように、本発明のアクシスパターは、バター軸2の上端部に水平断面が正三角形の三平面グリップ1を備え、バター軸2の下端部はヘッド3に固定される。バター軸2の下方先端部に雄ねじを切り、そこに雌ねじ付き締めナット5及び先端ナット4を嵌め込み螺合させてダブルナット構造にする。これらナットは外側に雄ねじを有し、23.5°の角度をもって傾斜したナット付きバター軸2の先端部をねじ込むことで

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きるねじ穴6をヘッド3に形成する。このねじ穴6にナット付きバター軸2の先端部をねじ込み、水平断面が正三角形の三平面グリップ1をヘッド3に対して所望の角度に位置づけて後、予め緩めておいた締めナット5を締めつけることによりバター軸2をヘッド3に固定してなる左右両打ち可能なアクシスパターである。バター軸2は図1に示すように、その中心線がヘッド3の水平上面から上方へ伸びる垂直線に対して23.5°の角度をもって傾斜する。しかも前記ダブルナット構造によりヘッド3に対して正三角形の三平面グリップを図1の矢印で

【0007】

【実施例2】ダブルナット構造をバター軸2先端部以外の所望位置に、例えば、バター軸のヘッドとの取り付け部とグリップ1との中間部、或いはグリップ1に近い位置に設けることもできる。その場合の構成、作用、効果は基本的に実施例1に同じである。

【0008】

【効果】上述のように、本発明は水平断面を正三角形にした三平面をもつグリップにし、ダブルナット構造によりヘッドに対して正角形の三平面グリップを360°回動可能にし、そのグリップを所望の角度位置に固定して後に使用するアクシスパターであるので、親指で1平面を押さえ、4本の指で稜線をにぎったり、或いは親指で

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1本の稜線を押さえ、他の4本の指で平面をにぎったり、時と場合によってにぎりを変化させることができ、グリップのにぎり心地を最適化してボールをホールへいれ易くする効果がある。本発明は上述のような構造にしたので、ダブルナット構造をバター軸の先端部以外のバター軸の所望位置に備えることができる効果がある。バターの軸傾を地球自転軸傾と同じ23.5°の角度にしたアクシスパターを提供できる効果がある。球を打つヘッド部分に相対する二つの同じ平面を設けることにより左右両打ちを可能にする効果がある。

【図面の簡単な説明】

【図1】本発明のアクシスパターの概略斜視図である。

【図2】本発明のアクシスパターの下方部分の縦断面図であって、バター軸の先端部とヘッドとのダブルナット結合を示す。

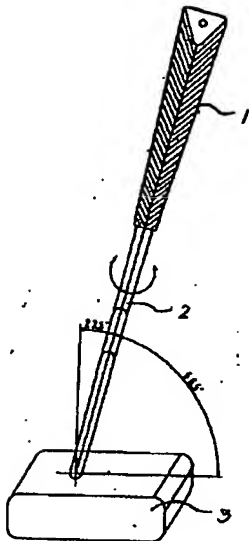
【図3】本発明のアクシスパターの正三角形グリップの縦断面図である。

【図4】図3のA-A線でとった断面図である。

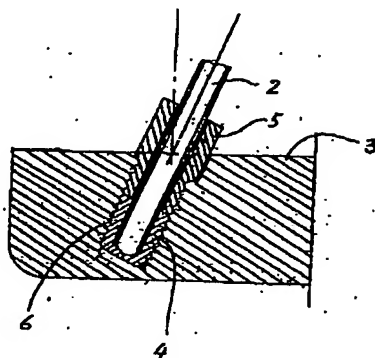
【符号の説明】

- | | | | |
|---|----------|---|---------|
| 1 | 正三角形グリップ | 2 | バター軸 |
| 3 | ヘッド | 4 | 先端ナット |
| 5 | 締めナット | 6 | ヘッドのねじ穴 |
| 7 | バター軸穴 | | |

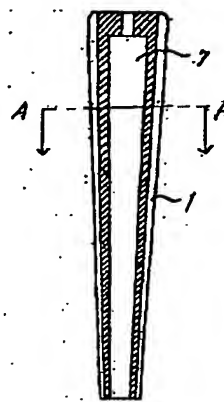
【図1】



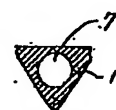
【図2】



【図3】



【図4】





US006152832A

United States Patent [19]

Chandler, III

[11] Patent Number: 6,152,832
[45] Date of Patent: Nov. 28, 2000

[54] GOLF PUTTER AND METHOD OF PUTTING

[75] Inventor: A. Russell Chandler, III, Atlanta, Ga.

[73] Assignee: The Whitehall Group, Ltd., Atlanta, Ga.

[21] Appl. No.: 09/057,283

[22] Filed: Apr. 8, 1998

[51] Int. Cl.⁷ A63B 53/00; A63B 53/14

[52] U.S. Cl. 473/293; 473/300; 473/313;
473/314; 473/292

[58] Field of Search 473/293, 294,
473/296, 298, 299, 300, 301, 302, 303,
313, 314, 251, 201, 204, 409, 292

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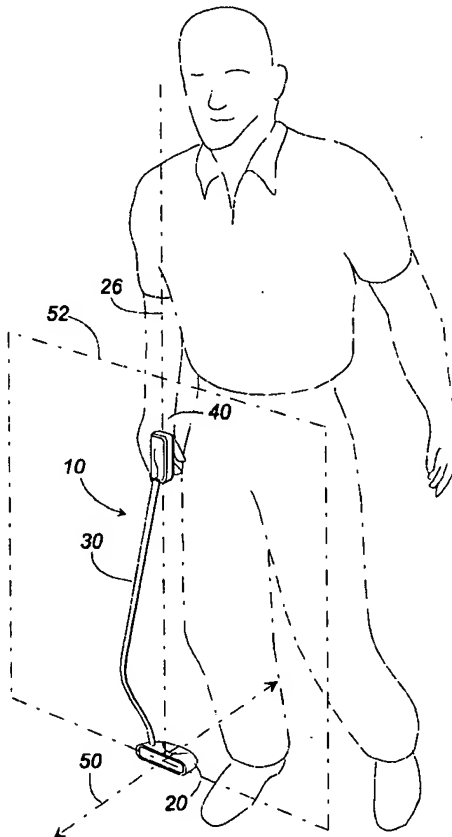
Primary Examiner—Sebastiano Passaniti

Attorney, Agent, or Firm—Needle & Rosenberg, P.C.

[57] ABSTRACT

A putter for use with a one-handed, modified, croquet-style putting stroke is described. The player is thus able to gain full advantage of his or her binocular vision because the player is able to face the target while aligning and stroking a putt. The geometry of the shaft is such that the grip is substantially centered vertically above the center of mass of the putter head when the putter is in a normal address position. The putter may include a head that allows the putter to be free standing in an address position, which assists the player in aligning a putt. The putter may also include a grip with at least one flat land and an angled bore, which provides tactile feedback to the player regarding the alignment of the putter face. The putter complies with the official rules of golf as promulgated by the United States Golf Association and the Royal & Ancient Golf Association in Great Britain. Finally, a method of using the putter is also described.

26 Claims, 5 Drawing Sheets



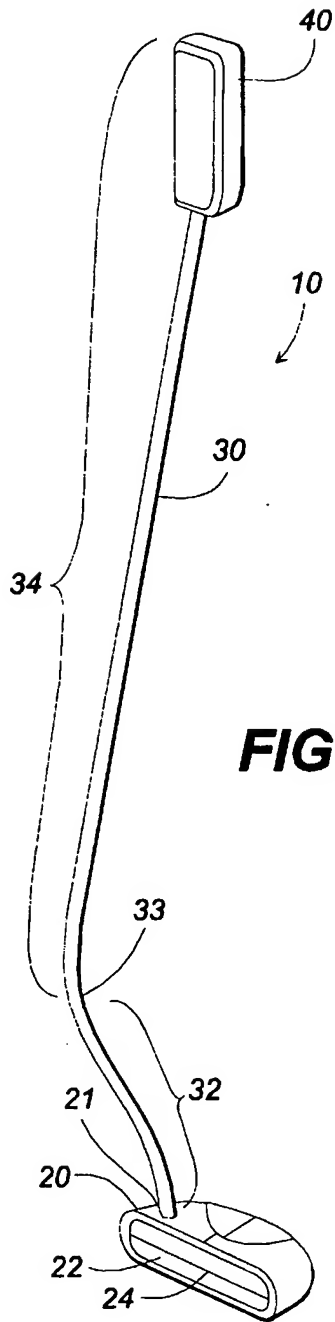


FIG. 1

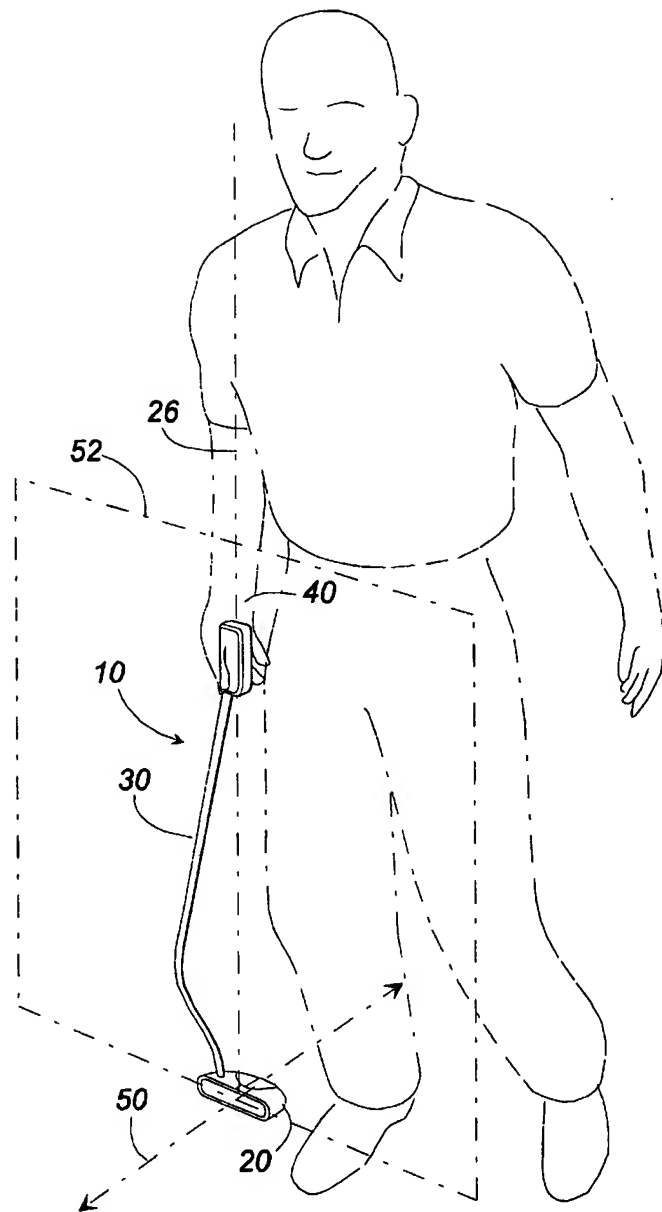
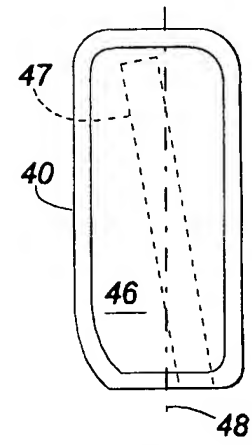
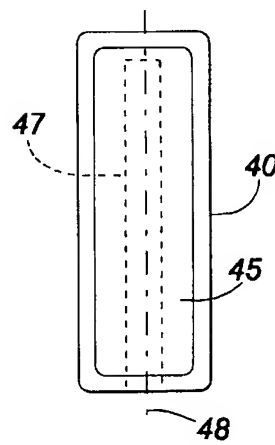
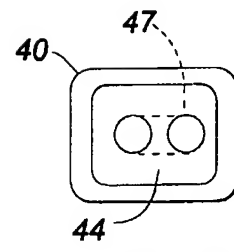
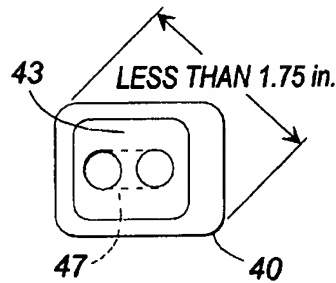
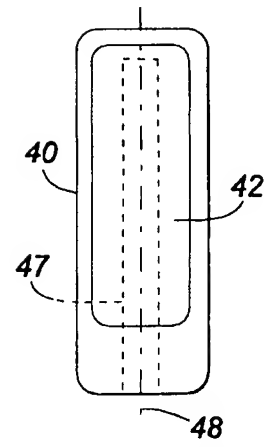
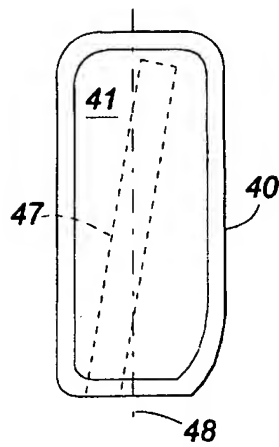
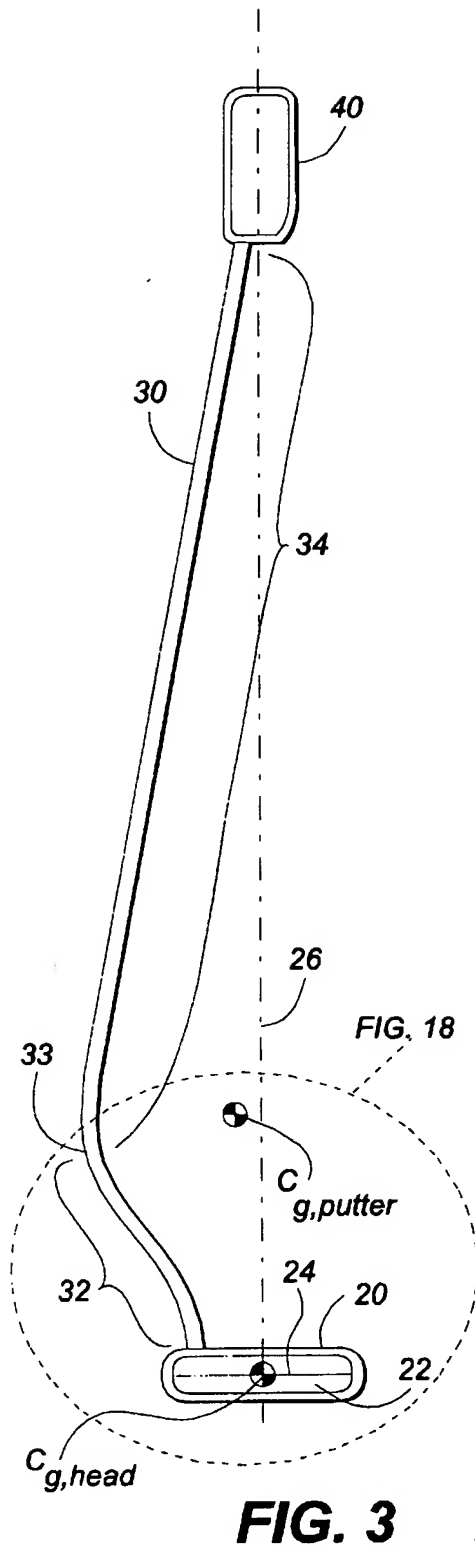


FIG. 2



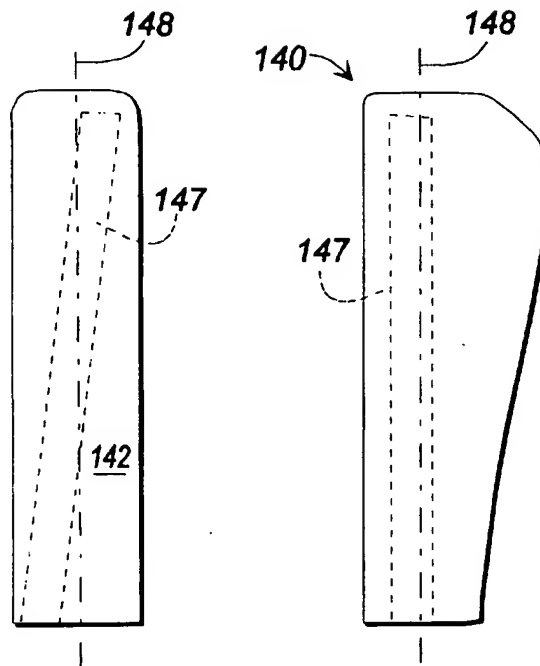


FIG. 10

FIG. 11

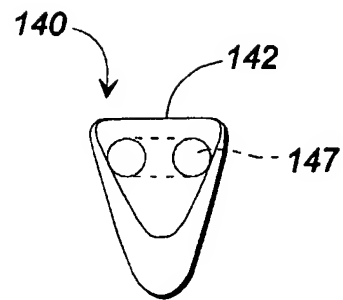


FIG. 12

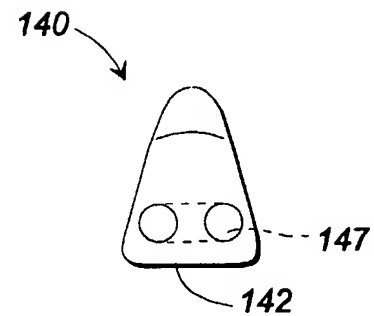


FIG. 13

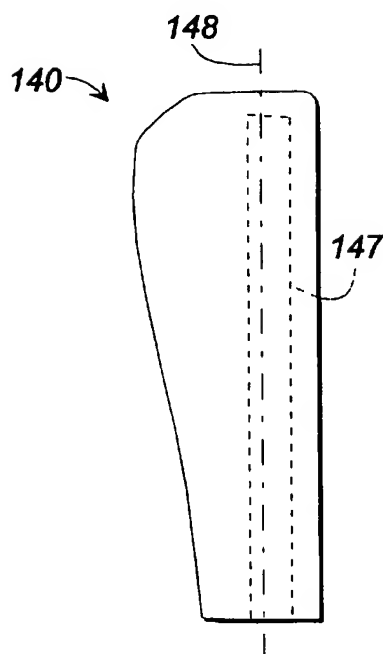


FIG. 14

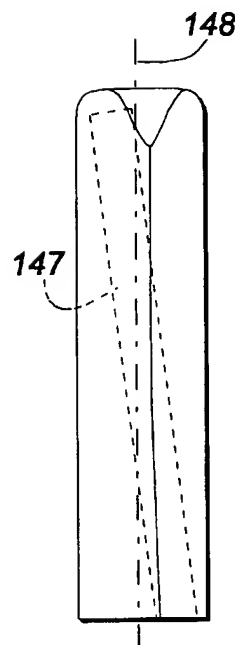


FIG. 15

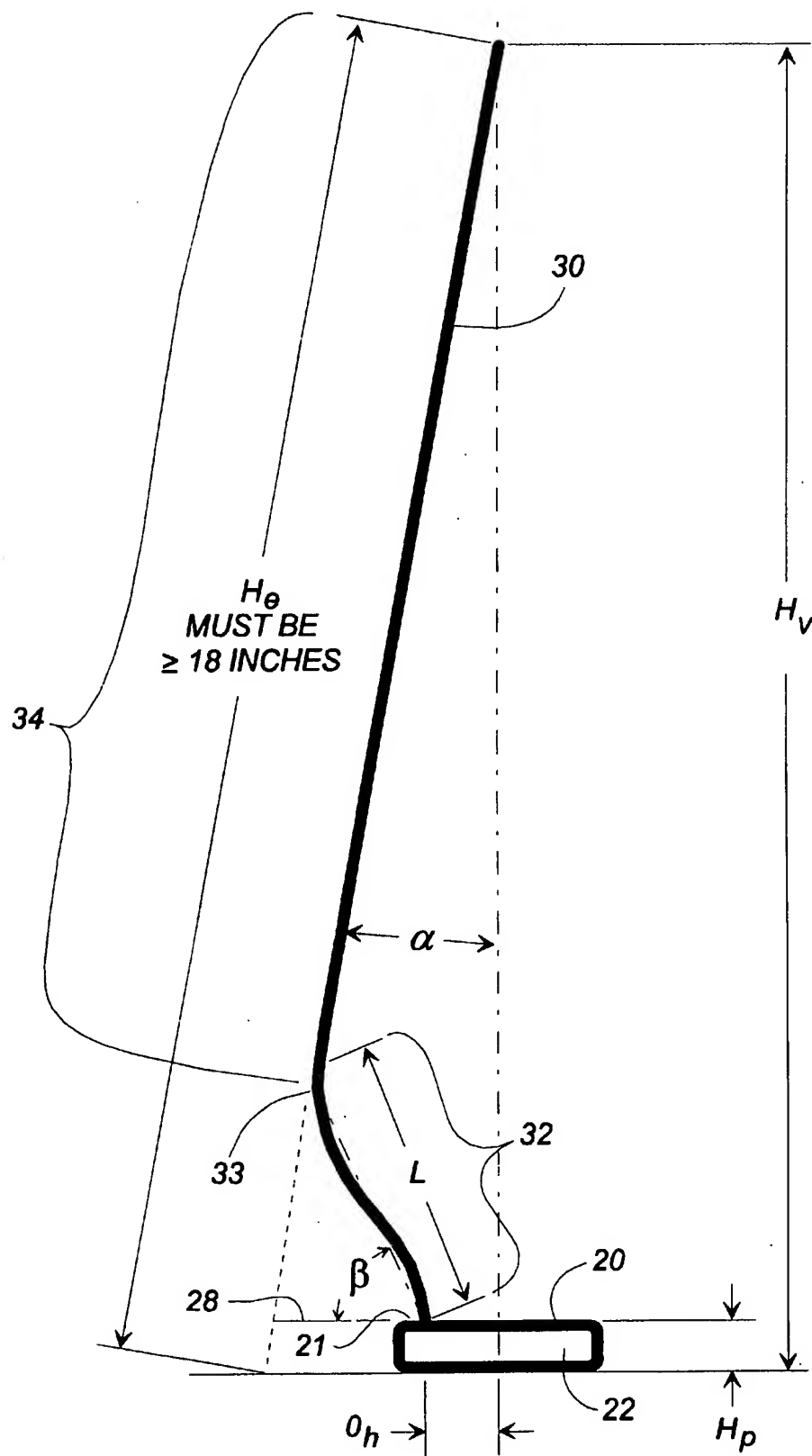
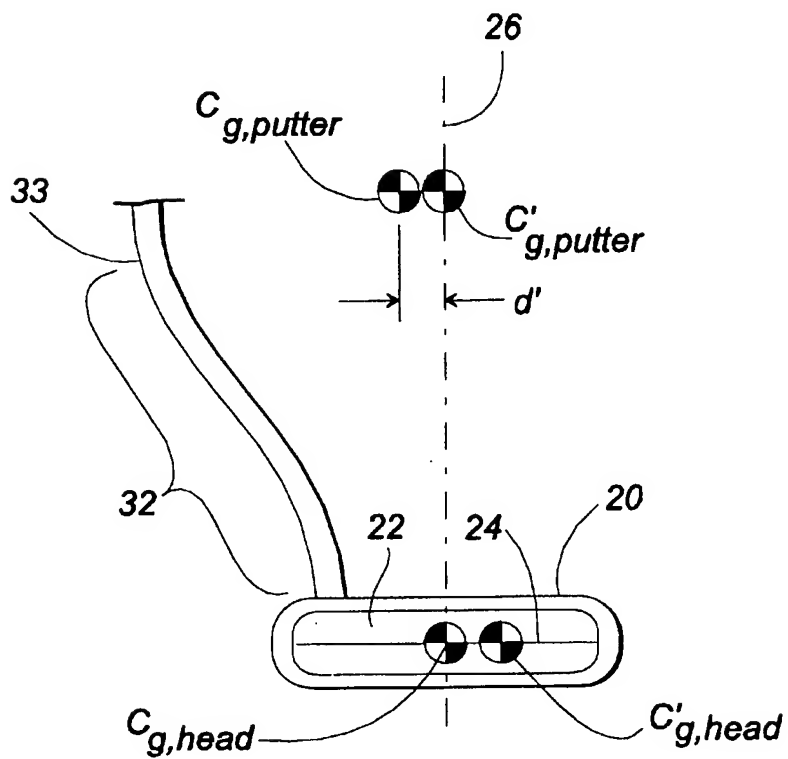
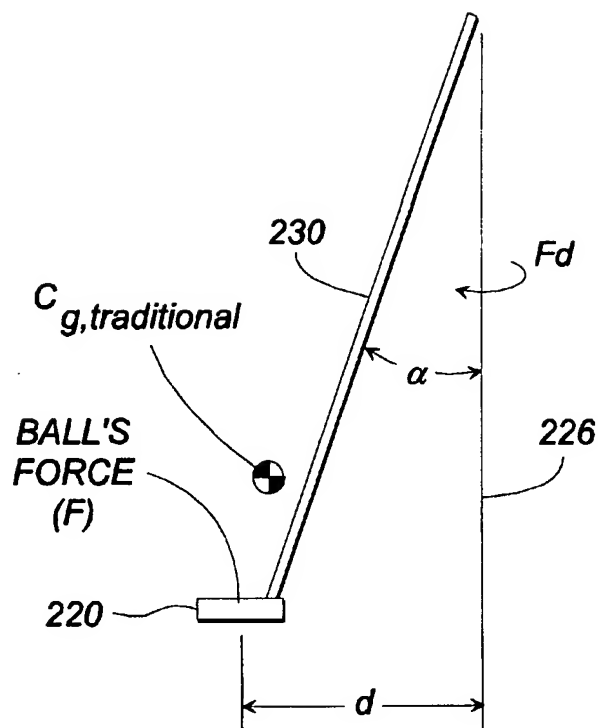


FIG. 16



GOLF PUTTER AND METHOD OF PUTTING

This invention relates to a golf putter and method of putting. More particularly a putter according to the present invention is specially designed for use with a modified croquet-style of putting that most naturally conforms to a one-handed, underhanded swinging motion. The putter and method according to the present invention also fully complies with the current Rules of Golf as promulgated by the Royal and Ancient Golf Association and the United States Golf Association and are thus designed for use in tournament play.

BACKGROUND OF THE INVENTION

The putt is perhaps the single most difficult yet important shot in golf. Before a player may even stroke the ball, the player must visually examine the contour of the putting surface and judge its effect on the path of a ball rolling toward the hole from the current position of the ball. Other characteristics of the putting surface or other factors can also have a significant effect on the path of a putt already stroked and rolling toward the hole. The direction in which the grass generally grows, the length of the grass on the putting surface, the type of grass on the putting surface, moisture on the putting surface, imperfections in the putting surface like footprints, spike marks or ball marks carelessly repaired, wind and a golf ball in which the center of mass and geometric center do not coincide are just some of the factors that affect the path of a rolling putt and, to some degree, for which the player must account. After examining the putting surface between the ball and the hole and accounting for other factors, the player must then execute a stroke that causes the ball to roll in a precise initial direction and with the precise speed required so that the ball's path intersects the hole and with speed slow enough for the ball to fall into the hole. Because of its complexity, nuance and potential for randomness, putting a ball into the hole is the most difficult and most precise task in golf. Yet, a putt is the single type of stroke that is most often required during a round of golf. To complicate matters further, the player's visual perception of the target is skewed which leads to errors in alignment because the player does not face the target while addressing the ball or stroking a putt. Instead, the player views the target while looking laterally down the intended target line. This sub-optimal visual perspective causes visual distortion that interferes with the player's ability to align the putting stroke with the target line that was chosen while standing behind the ball and looking toward the hole in order to determine the intended target line. This visual effect is detailed in a book entitled "See It & Sink It—Mastering Putting Through Peek Visual Performance" by Dr. Craig L. Farnsworth.

Golf courses are designed and standards for scoring are set based on the assumption that a player will be able to hit the ball onto the putting surface in two strokes less than par for each hole. Once on the ball is on the putting surface, the player is allowed two putts to stroke the ball into the hole in order to play the hole at par. Thus, an 18-hole golf course is designed to allow 36 putts in a round of golf played at par. Most, though not all, 18-hole golf courses play to a par of 72, which means that putting constitutes approximately 50% of the strokes prescribed for a round of golf.

The importance of putting in golf is illustrated by the professional careers of many notable players. Sam Snead, the winner of more officially sanctioned professional tour events than any other player, is a notable example of an extraordinary player who struggled with his putting stroke

late in his career. In an attempt to cure his wavering putting stroke, Sam Snead adopted a croquet-style putting stroke in which he straddled the target line of his putt, drew his putter back between his legs and struck the ball with a pendulum-like swing along the target line. His croquet-style putting stroke worked relatively effectively for him until the Royal & Ancient Golf Association and the United States Golf Association (the "USGA") changed the Rules of Golf ("the Rules") to make his stroke illegal.

The Rules allow a player to use a modified croquet-style stroke in which the player stands with both feet on one side of the target line and faces the target. This type of stroke is thought by some, including the inventor, to be more effective for a number reasons. For example, the player may simultaneously address the putt and execute the stroke from a position that permits both eyes to focus on the target.

The Rules were also changed to make it more difficult to design a putter that would be useful for making such a stroke. The Rules allow the shaft of a putter to be connected to any point on the putter head and to have bent and straight portions, with the bent portion having a length measured along its axis less than or equal to 5 inches. The Rules also require that the projection of the straight portion of a putter shaft onto a plane perpendicular to the target line diverge at least 10° from vertical. Additionally, the overall length of the shaft, measured along a straight-line extension of the straight portion of the shaft to the ground when the putter is grounded, must be greater than or equal to 18 inches.

When using a traditional putting stroke, a player faces a direction generally perpendicular to the target line and thus must turn to look down the target line when preparing to stroke the ball. This creates a visual distortion that interferes with the player's ability to perceive accurately the location of the target. Because of this effect, most right-handed players perceive that the target is farther right than its actual location. Additionally, the player loses depth perception in viewing the target in such a manner because the effective distance between the player's eyes (in a direction perpendicular to a line from the eyes to the target) is small when viewing the target from such a traditional stance.

Aside from the disadvantages in viewing the target and determining the proper line and distance to the target stemming from the use of the traditional putting stance, this stance also interferes with the mechanics of putting. Specifically, the primary axis around which the putter swings during a traditional putting stroke is defined by the player's spine. When taking a traditional stance and swinging a putter from such a stance, the player swings the shoulders in such a manner that the putter rotates around the spine. Assuming a fixed relationship between the player's hands and spine, the resulting stroke follows an arc that moves inside the target line on the back swing, to the target line at impact (at least if performed properly), and back inside the target line after impact. When traveling along such an arc (and still assuming the fixed spatial relationship between the hands and the spine), the face of the putter also rotates relative to the target line during the stroke. On the back swing, the putter face opens to the target line, at impact the putter face is perpendicular to the target line (again if the stroke has been properly executed), and the putter face closes to the target line after impact.

A noted contemporary instructor on putting, Dave Pelz has studied the effects of misalignment relative to the target line (when the putter strikes the ball) of (1) the putter's swing path, (2) the putter face and (3) the optimum hitting location on the putter face on the ultimate putting success.

Mr. Pelz has found that all three types of misalignment cause significant error in the putting stroke and thus decrease the chances of the ball going into the hole. However, he opines that misalignment of the putter face causes the largest deviation from the player's intended path of any particular putt. In order to reduce the possibility of misalignment of the putter face, path and hitting location, Mr. Pelz recommends that the player's putting stroke start with the optimum hitting location on the putter face immediately adjacent to the ball and that the stroke travel along a path aligned with the target line with the face remaining perpendicular to the target line for the entire stroke. However, as explained above, when a player swings the putter around the spine only, such a stroke does not result. In fact, the putter path corresponds to the target line at only one point in its arc and the face is perpendicular to the target line at only one point in its arc—and these two points do not necessarily coincide. Thus, to execute a stroke with a path along the target line and with a square putter face while using a traditional putting stance and stroke requires a complex combination of multi-axis rotational movements. Executing such a multi-axis stroke in a manner that accomplishes the primary and complex task of causing a ball to roll smoothly along a precise path at a precise speed renders the most difficult and important stroke in golf even more difficult. Some of the most common practice aids and drills in golf are designed purely to enable players to ingrain this complex, multi-axis putting stroke into their muscle memory. Other players simply concentrate on swinging the putter around only their spine and training themselves to hit the ball at the precise moment in time when the putter path, face and hitting location are correctly aligned with the target line. Thus, both widely adopted approaches to executing the traditional putting stroke suffer from disadvantages that interfere with the ultimate goal—putting the ball into the hole.

The only way in which to avoid the disadvantages associated with the traditional putting stroke is to swing the putter head around a horizontal axis of rotation that is perpendicular to the target line—exactly the result of Sam Snead's outlawed croquet-style stroke. It is possible, however, to design a putter within the Rules that allows the player to swing the putter on an arc defined by rotation around a horizontal axis that is perpendicular to the target line, or at least on an arc close to this optimum arc. The resulting putting stroke is executed while the player stands generally facing the target with both feet on one side of the target line. Numerous putters have been designed to allow a player to take such a stance and execute such a stroke, but always with some type of requirement to manipulate the club in a secondary manner not associated with purely swinging the putter around a horizontal axis perpendicular to the target line. Each of the following U.S. Patents describe a putter for use with modified croquet-style stance and stroke as described above, but they all have characteristics that interfere with the natural pendulum action of the putting stroke, or do not comply with the Rules.

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5,125,657	Beil	6/30/92
Re. 33,169	Leek	2/20/90

Kropp, for example describes a putter suitable for use with a two-handed stroke in which the upper end of the grip lies vertically above the heel rather than the center of the face. Thus, if a player were to grasp Kropp's putter with one hand on the upper end of the grip, the natural tendency of the putter would be to hang such that a line from the upper end of the grip to the center of the face is angled toward the player when viewed from the front at address. Any attempt to use Kropp's putter in a one-handed putting stroke would likely result in the player striking the ball away from the center of the face. Bernhart and Florian describe putters that are similarly configured to Kropp's putter, but having a top end of the grip that is even more misaligned with the center of the face.

Guendling, Jr. describes a putter designed for use with a one-handed stroke in which the upper end of the grip does lie vertically above the center of the face when used in a stroke as is evident from Guendling Jr.'s FIG. 3. However, Guendling, Jr.'s putter does not comply with the Rules because the angle between the axis of the straight portion of the shaft of the putter in its normal address position and vertical is less than 10° (it is actually 0°). Leek, Drake and Beil describe putters that similarly do not comply with the Rules. Additionally, the Guendling, Jr. putter is shown to be of 10–26 inches in length, which violates the Rules requirement that the putter shaft be at least 18 inches long as measured from the top of the grip along the axis of the shaft or a straight-line extension of the shaft to the sole of the club.

Thus, a need continues to exist for a putter suitable for use with a modified croquet-style stroke that complies with the Rules and facilitates a natural, pendulum-type swinging stroke with little or no extraneous manipulation of the putter when making a stroke.

SUMMARY OF THE INVENTION

The putter and method according to the present invention improves upon prior art devices and methods by employing a putter having a grip for which the effective center of the grip is located substantially vertically above the center of the face of the putter at address while simultaneously being suitable for play as permitted under the Rules.

A golf putter according to the present invention is adapted for use with a one-handed, modified croquet-style putting stroke. Like all putters, a putter according to the invention includes a head, and the head defines a center of mass. The face of the putter also defines a face angle line that lies on the face and is generally horizontal when the putter is in a normal address position. Also like all putters conforming to the Rules, a shaft extends from the head of the putter of the invention. A connector portion of a shaft is attached to the head and may be attached at any point on the head. At least a portion of the shaft is straight, and the straight portion extends from the connector portion to a free end on which the grip is mounted.

When stroking a putt, the player grasps the grip and the putter is balanced such that the center of the putter face naturally hangs substantially directly below the player's shoulder joint. This balance, along with the one-handed stroke, allows the player to swing the putter around only one

pivot point, his or her shoulder joint, in a single plane that contains the intended target line. Additionally, the player's arm hangs in an anatomically neutral position—virtually the same position in which the arm hangs while standing in a relaxed state. When swinging the putter, the player swings his or her arm in a natural manner similar to the manner in which the arms swing while walking. This type of pendulum motion within a plane containing the target line maximizes the chances that the putter face will be aligned perfectly with the target line at impact. The lack of manipulation required by the player to keep the putter face square at impact (or artificially to keep the putter head traveling within a plane containing the target line) permits a smoother, rhythmic, more athletic stroke that is free of the muscle tension inherent in a normal stroke, which can interfere with the player's feel and thus distance control. To aid in the alignment of the putter face during a stroke, the grip is constructed of rubber, synthetic rubber or any other suitably compliant material typically used for golf club grips. The grip also preferably includes at least one flattened portion that provides tactile feedback to the player regarding the alignment of the face. The grip may also include other flattened portions to provide further tactile feedback regarding face alignment.

The grip further includes a bore that is offset at an angle such that the longitudinal axis of the grip is substantially vertical when the putter is in a normal address position. This offset bore enhances the effectiveness of the putter because it provides yet another tactile reference for the player, a grip that is in alignment with the plane in which the putter head swings and with the vertical plane containing the intended target line.

It is accordingly an object of the present invention to provide a putter for use with a one-handed, modified, croquet-style putting stroke that is substantially self aligning because it is balanced such that the center of mass of the putter swings naturally, and with little or no manipulation by the player, and directly from the player's shoulder joint, thus enabling a smooth putting stroke substantially within a vertical plane containing the intended target line.

It is a further object of the present invention to provide the player optimal sight alignment by allowing the player to look directly behind and along the intended target line of a putt, thus eliminating the visual distortion resulting from standing in a traditional putting stance and looking laterally down the target line.

It is a further object of the present invention to provide a putter that can stand on its own in a normal address position so that the player may examine the alignment of the putter from behind the putter along the target line.

It is a still further object of the present invention to provide a putter with a grip having one or more flattened portions that facilitate alignment of the putter face by providing real time tactile feedback to the player about the face alignment.

It is a still further object of the present invention to provide a putter with a grip having an offset bore such that the longitudinal axis of the grip remains in the vertical plane containing the intended target line as the player swings the putter.

It is a still further object of the present invention to provide a method of putting that enables a player to obtain the full advantage of his or her binocular vision while aligning a putt and executing a putting stroke.

It is a still further object of the present invention to provide a method of putting that enables a player to swing

a putter exclusively from the shoulder joint so that the putter head remains square to and directly over the target line throughout the entire stroke.

It is a still further object of the present invention to provide a method of putting that enables a player to use effectively the small muscles in the hand and wrist in a putting stroke in order to gain the benefits of the fine motor control inherent in those muscles.

Other objects, features and advantages of the present invention will become apparent with reference to the remainder of this document.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the putter from the front illustrating the overall configuration of one embodiment of a putter according to the present invention.

FIG. 2 is a perspective view of the putter of FIG. 1 illustrating the relationship among the putter head, the grip and the player's shoulder joint when the putter and player are in a normal address position.

FIG. 3 is front elevational view illustrating the putter of FIG. 1 and the substantially vertical alignment of the center of mass of the putter head and putter as a whole with the grip when the putter is in a normal address position.

FIG. 4 is a front elevational view of an embodiment of a grip suitable for use with the putter of FIG. 1.

FIG. 5 is a right side elevational view of the grip shown in FIG. 4.

FIG. 6 is a bottom plan view of the grip shown in FIG. 4.

FIG. 7 is a top plan view of the grip shown in FIG. 4.

FIG. 8 is a left side elevational view of the grip shown in FIG. 4.

FIG. 9 is a back elevational view of the grip shown in FIG. 4.

FIG. 10 is a front elevational view of a second embodiment of a grip suitable for use with the putter of FIG. 1.

FIG. 11 is a right side elevational view of the grip shown in FIG. 10.

FIG. 12 is a bottom plan view of the grip shown in FIG. 10.

FIG. 13 is a top plan view of the grip shown in FIG. 10.

FIG. 14 is a left side elevational view of the grip shown in FIG. 10.

FIG. 15 is a back elevational view of the grip shown in FIG. 10.

FIG. 16 is a schematic view of a putter according to the present invention illustrating the geometry of the putter.

FIG. 17 is a schematic view of a traditional putter illustrating the twisting moment induced by the horizontal distance between the striking area of the face of the putter and the grip.

FIG. 18 is an exploded front elevational view of the face of the putter shown in FIG. 3 illustrating the manner in which the center of mass of the putter head can be positioned such that the center of mass of the putter as a whole is positioned directly below the grip and above the geometric center of the face of the putter.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a perspective view of the putter from the front illustrating the overall configuration of one embodiment of a putter according to the present invention. A connector

portion 32 of shaft 30 extends from point 21 located anywhere on putter head 20, and straight portion 34 extends from point 33 on connector portion 32 to a free end of shaft 30. The connector portion may be of any acceptable configuration including, for example, (1) a curved portion integrally formed with the straight portion 34 as shown, (2) a separate component, (3) an integrally formed part of the head, or (4) a second straight portion of the shaft at a different angular orientation from straight portion 34. Grip 40 is mounted on the free end of straight portion 34 of shaft 30 and is configured such that the player may comfortably hold, position and swing the putter head while stroking a putt. Putter head 20 shown in FIG. 1 and in all other figures is of a mallet design that is weighted more heavily in its sole and on its lateral portions. Such a putter head, along with other suitable designs, offers the advantage that putter 10 is free standing. Thus, a player may place putter 10 on the intended target line in its normal address position, let it go, and examine the alignment of putter head 20 and thus face 22 with target line 50 before regripping grip 40 and stroking a putt. While the illustrated mallet putter head design is well suited for use in a putter according to the invention, its depiction in the figures does not exclude the use of other putter head designs in a putter according to the invention.

A player uses putter 10 to hit the ball with a one-handed, modified croquet-style putting stroke. Like all putter heads, head 20 has a center of mass ($C_{g, head}$). The face 22 of putter head 20 also defines a face angle line 24 that lies on the face and is generally horizontal when the putter is in a normal address position. Also, like all putters conforming to the Rules, a shaft 30 extends from the putter head 20. A connector portion 32 of shaft 30 is attached to the putter head 20 at point 21, which may be any point on putter head 20. At least a portion of shaft 30 is straight, and straight portion 34 extends from point 33 on connector portion 32.

An alternative embodiment of putter 10, not shown, has a shaft with no curved or angled connector portion. In such an embodiment, the straight portion of the shaft is connected directly to the putter head. Such an arrangement is only possible when the point at which the shaft is connected to the head is located far enough away from the geometric center of the putter head to allow the grip to be appropriately located above the geometric center of the putter head while simultaneously complying with the Rules.

FIG. 2 is a perspective view of the putter of FIG. 1 illustrating the relationship among putter head 20, grip 40, the player's shoulder joint and the player's arm when putter 10 and a player are in a normal address position. Also shown in FIG. 2 is vertical plane 52, which contains face angle line 24 (shown in FIG. 1) and is perpendicular to intended target line 50. Plane 52 is the plane onto which straight portion 34 (shown in FIG. 1) is projected in determining whether shaft 30 complies with the Rules. The way in which plane 52 is used in determining compliance with the Rules is explained more fully below in connection with FIG. 16.

FIG. 2 also discloses a player in a normal address position, holding putter 10 with his or her dominant hand and preparing to stroke a putt along an intended target line 50. FIG. 2 further discloses a player in a normal address position, holding putter 10 with his dominant hand with the arm substantially fully extended. The vertical alignment of putter head 20, grip 40, the player's arm and shoulder joint are apparent. As can be seen, the player stands beside the intended target line 50 and facing the intended target. This allows the player to look directly behind and along the intended target line 50 of a putt while aligning and while stroking the putt. Thus, a player may obtain the full advan-

tage of his or her binocular vision throughout the putting process. This is a particularly important feature of putter 10 because it substantially removes the single obstacle to proper alignment that cannot be perceived by a typical player directly. That is, when using a traditional putter, a player must compensate for the visual distortion caused by viewing the target laterally (and only during a putting stroke and not during the alignment process) by watching how and where the ball rolls after it is struck. The difficulty with this type of feedback is that the player cannot distinguish the error caused by visual distortion from the error caused by other factors (e.g., a poorly struck putt or a poorly chosen intended target line).

When stroking a putt with putter 10 in a manner most suited to take advantage of the design of putter 10, the player swings putter 10 completely within a substantially vertical plane containing the intended target line 50. Additionally, the player should keep face angle line 24 perpendicular to target line 50 throughout the stroke. As explained more fully below, grip 40 is particularly suited to aid the player in keeping face angle line 24 perpendicular to target line 50 throughout the stroke (i.e., in keeping the face square to the target throughout the stroke). When stroking long putts, the player may keep his or her wrist relatively stiff such that the putter head 20 swings from a pivot point at the player's shoulder joint, such as the natural movement of the normal arm swing when one walks. The movement of putter 10 using this stiff-wristed stroke is accomplished using the relatively large muscle groups that move a player's entire arm from the shoulder joint. When stroking short putts, a player may desire to use a wrist-actuated stroke in which putter head 20 rotates around a pivot point at the player's wrist rather than the shoulder joint. Such a stroke is performed using the small muscle groups of the hand and wrist and may provide more "feel" and fine control than the stiff-wristed, shoulder-based stroke described immediately above. The key with both strokes, however, is in keeping putter head 20 moving along target line 50 with face angle line 24 perpendicular to target line 50 throughout the stroke. Ultimately, whether a particular player prefers the wrist-based stroke, shoulder-based stroke, or a combination of the two in a particular set of circumstances is a matter of personal preference.

FIG. 3 is front elevational view illustrating the putter of FIG. 1 and the substantially vertical alignment of the center of mass of putter head 20 ($C_{g, head}$) and grip 40 when putter 10 is in a normal address position. It should also be noted that the center of mass of the entire putter ($C_{g, putter}$) is also approximately vertically aligned with grip 40. When viewed from the front, as illustrated in FIG. 3, face angle line 24 and vertical line 26 intersect substantially directly in front of $C_{g, head}$. Typically, $C_{g, head}$ substantially coincides with the geometric center of face 22 of putter head 20 when a putter head is viewed from the perspective shown in FIG. 3. Because shaft 30 is not symmetric about vertical line 26, the weight of shaft 30 will cause $C_{g, putter}$ to be located slightly leftward and higher than $C_{g, head}$ (from the perspective shown in FIG. 3). As described more fully below in connection with FIG. 18, putter head 20 can be designed so that $C_{g, putter}$ is substantially vertically aligned with the geometric center of face 22 of putter head 20. This would be accomplished by concentrating weight on the right side and bottom of putter head 20.

FIGS. 4-9 are the six normal views of one embodiment of a grip suitable for use with a putter according to the present invention. Grip 40 may be described generally as a block of resilient material with substantially flat lands 41-46 respec-

tively on each of six sides. The corners and edges at which lands 41–46 meet are appropriately rounded for the player's comfort. Grip 40 is made of rubber, synthetic rubber, or any of the materials of which conventional golf grips are made. FIG. 4 is a front elevational view of an embodiment of a grip suitable for use with the putter of FIG. 1. The lower right corner of grip 40 as seen in FIG. 4 is rounded with a relatively large radius to form a comfortable resting place for the player's thumb, for example, when the player holds grip 40 such that the posterior side of the player's hand faces the target. Of course, a player may choose to hold grip 40 in a different manner, and grip 40 as shown has been found to be compatible with virtually any type of hold chosen by a player. Bore 47 through grip 40 is angled relative to lands 42 and 45. The angular offset of bore 47 compensates for the angle of straight portion 34 of shaft 30 from vertical when putter 10 is in a normal address position. The angular offset of bore 47 thus enables a player naturally and comfortably to grasp putter 10 in its normal address position with the $C_{g, head}$ and/or $C_{g, putter}$ substantially vertically aligned with longitudinal axis 48 of grip 40.

The angular offset of bore 47 ensures that lands 41–46 define planes that are preferably either parallel or perpendicular to face angle line 24 so that lands 41–46 provide a tactile reference for the player of the alignment of putter face 22. That is, the player can feel how putter face 22 is aligned by how lands 41–46 of grip 40 feel within his or her grasp. FIG. 6 is a bottom plan view of the grip shown in FIG. 4 in which the maximum cross-sectional width of grip 40 is apparent. In order to comply with the Rules, this maximum cross-sectional width dimension must be no greater than 1.75 inches.

FIGS. 10–15 are the six normal views of a second embodiment of a grip suitable for use with a putter according to the present invention FIG. 1. Grip 140 shown in FIGS. 10–15 has an approximately triangular cross section and one substantially flat land 142 that is substantially perpendicular to target line 50 when putter 10 is in a normal address position. Grip 140 has an offset bore 147 to reorient grip 140 with respect to straight portion 34 of shaft 30. Preferably, the longitudinal axis 148 of grip 140 is substantially vertical when putter 10 is in a normal address position. The particular shape of grip 140 has been found to be a more anatomically compatible shape than grip 40, but grip 140 provides most, if not all, the advantages of grip 40.

FIG. 16 is a schematic view of a putter according to the present invention illustrating the geometry of the putter. While the schematic illustration provides a description of the geometry of a putter in a two-dimensional space, one of skill will understand that putters are three-dimensional articles. Thus, FIG. 16 and the accompanying discussion below are not meant to limit the putter of the present invention to one in which the geometry is limited to the two-dimensional relationships among the shaft, putter head and grip shown and discussed in connection with FIG. 16.

In particular, FIG. 16 illustrates the angle (α) between the straight portion 34, when projected onto a plane parallel to face angle line 24, and vertical line 26 when putter 10 is in a normal address position (the orientation shown). Connector portion 32 defines a straight line distance, L, from point 21 (at which connector portion 32 connects to putter head 20) to point 33 (at which connector portion 32 meets straight portion 34). The line from point 21 to point 33 forms an angle (β) with horizontal line 28. Distance H_e is defined as the vertical height of putter 10 from the top of straight portion 34 to the ground when the putter is in a normal address position. Distance H_p is the height of putter head 20

from the ground to point 21. Distance O_h is the horizontal distance, measured when putter 10 is in a normal address position, between the geometric center of face 22 to point 21. Distance H_e is the effective height of putter 10 (and is the dimension used to determine compliance with the Rules) and is measured along a projection of straight portion 34 to its intersection with the ground when the putter is in a normal address position.

The equation defining H_e in terms of α , β , H_p , L, and O_h (as those terms are shown and described in connection with FIG. 16) is:

$$H_e = \frac{1}{\cos \alpha} \left\{ H_p + \frac{L[\cos(\beta - \alpha)]}{\sin \alpha} + \frac{O_h}{\tan \alpha} \right\}$$

As already mentioned above, this equation and analysis assumes that points 33 and 21 are located in the same vertical plane onto which straight portion 34 is projected in order to determine angle α . If, for example point 21 were in this plane and point 33 were "behind" that plane (when putter 10 is in a normal address position and putter 10 is viewed from the front), then the projection of L onto the same plane onto which the straight portion 34 is projected would be necessary to find an adjusted value for L to be used in the equation above (this adjusted value for L would be less than the actual value L). For simplicity, L is assumed to be defined by points 21 and 33 that are located within the vertical projection plane. However, this simplifying assumption about the location of points 21 and 33 does not limit the scope of the invention. For example, point 33 could be located forward (i.e., toward the target at address) or aft of the vertical plane 52 (shown in FIG. 2).

In order to comply with the Rules, angle α must be at least 10° . The Rules also require that, the length of connector portion 32 ($L_{connector}$) must be no greater than 5 inches (as measured along the axis of connector portion 32 from point 33 through point 21 to the closest point on the sole of putter head 20). Because connector portion 32 may be curved and a curved path between two points is longer than a straight line, L as defined above is less than $L_{connector}$ in all cases except when connector portion 32 is a straight section and point 21 is located on the sole of putter head 20 (i.e., when $H_p=0$). Under the Rules, H_e must be no less than 18 inches. However, in order to allow a player to use a putter comfortably, H_e is typically about 27 inches.

For putter 10 according to the present invention, H_e is maximized when α and β are exactly 10° . However, the value of α has a much more significant effect upon H_e than β . For example, values of up to 60° for β are possible while maintaining a value of H_e of about 30 inches. By contrast, increasing α from 10° to only 15° , while holding other parameters constant, can cause H_e to shrink by about 12 inches. Thus, angle α is preferably exactly 10° or only slightly larger. Of course, variations in the geometry of shaft 30 and putter head 20 are possible within the scope of the present invention. For illustration purposes only, the table below depicts the manner in which H_e varies for certain values of α , β , L, H_p , and O_h . The values shown in the table are not meant to limit in any way the range of acceptable values for any of the parameters included.

Effective Height (H _e) (in.)	Horizontal Offset (O _h) (in.)	Putter Height (H _p) (in.)	Shaft Angle (α) (degrees)	Effective Connector Length (L) (in.)	Connector Angle (β) (degrees)
25.6	0.0	0.75	10	4.25	10
28.5	0.5	0.75	10	4.25	10
31.4	1.0	0.75	10	4.25	10
34.3	1.5	0.75	10	4.25	10
37.1	2	0.75	10	4.25	10
33.9	2	0.75	11	4.25	11
31.3	2	0.75	12	4.25	12
29.1	2	0.75	13	4.25	13
27.1	2	0.75	14	4.25	14
25.5	2	0.75	15	4.25	15
24.1	2	0.75	16	4.25	16
22.8	2	0.75	17	4.25	17
21.7	2	0.75	18	4.25	18
37.1	2	0.75	10	4.25	10
34.2	2	0.75	10	3.75	10
31.3	2	0.75	10	3.25	10
28.4	2	0.75	10	2.75	10
25.4	2	0.75	10	2.25	10
22.5	2	0.75	10	1.75	10
19.6	2	0.75	10	1.25	10
33.9	1.5	0.75	10	4.25	0
34.3	1.5	0.75	10	4.25	10
33.9	1.5	0.75	10	4.25	20
32.8	1.5	0.75	10	4.25	30
30.9	1.5	0.75	10	4.25	40
28.4	1.5	0.75	10	4.25	50
25.4	1.5	0.75	10	4.25	60
21.8	1.5	0.75	10	4.25	70
17.9	1.5	0.75	10	4.25	80

FIG. 17 is a schematic view of a traditional putter illustrating the twisting moment induced by the horizontal distance between the striking area of the face of the putter and the grip. Putter head 220 is shown attached to shaft 230 in a traditional manner with shaft 230 attached to putter head 220 at the heel of head 220. Because of angle α, the free end of shaft 230 where a grip would be mounted is located a horizontal distance d from the free end of shaft 230, which is measured from the point where a ball normally would strike head 220 to line 226 (extending vertically downward from the free end of shaft 230). When a ball strikes the face of head 220 at the indicated location with a force F, a moment equal in magnitude to the product Fd is generated. In order to keep the face of putter head 220 square to the intended target line, a player using a traditional putter must counteract moment Fd by applying a moment of equal magnitude but in the opposite direction.

A similar moment is generated when a player swings the putter and accelerates putter head 220. The magnitude of this acceleration-induced moment is equal to the product of the mass of the entire putter, the acceleration of the putter's center of mass (C_{g, traditional}) and the distance from C_{g, traditional} to line 226. When, for example, the putter head 220 is accelerated toward the target, the induced moment is in the same direction as that shown as Fd in FIG. 17. Thus, the player must resist and compensate for two twisting moments when swinging a traditional putter and striking a ball. One moment is induced by acceleration and the center of mass of the putter being located at a horizontal distance from line 226. The other moment is induced by the force imparted on the putter face when the face strikes the ball at a point which is horizontally distant from line 226. The resistance to and compensation for these twisting moments interfere with the player's ability to develop a consistent feel and stroke. In essence, these twisting moments interfere with the player's ability to putt consistently and they needlessly add variables to an already complex physical task—a putting stroke.

FIG. 18 is an exploded front elevational view of the face of the putter shown in FIG. 3 illustrating the manner in which the center of mass of the putter head can be positioned such that the center of mass of the putter as a whole is positioned directly below the grip and above the geometric center of the face of the putter. C_{g, putter} and C_{g, head} represent the centers of mass of a putter according to the present invention using a typical putter head respectively. Most conventional putter heads are designed with C_{g, head} positioned so that it is aligned with the geometric midpoint of the face in the horizontal direction (i.e., on line 26, which bisects face 22). Such a conventional putter head can be effectively incorporated into a putter according to the present invention. If such a conventional putter head is incorporated into a putter according to the present invention, the resulting center of mass of the entire putter is positioned toward shaft 30 and upward, for example, to location C_{g, putter}. With this arrangement, no moment is induced when the ball strikes face 22 at a point on line 26 because there is no horizontal distance between line 26 and the point on face 22 at which the ball strikes face 22. However, a small, acceleration-induced moment will exist because of the horizontal distance, d', between C_{g, putter} and line 26. It is possible, however, to design putter head 20 in a manner that eliminates both types of moments.

Putter head 20 may be designed such that the center of mass of head 20, C'_{g, head}, is on the opposite side of line 26 from the side on which shaft 30 is located in precisely that location that will cause the center of mass of the entire putter, C'_{g, putter}, to be located on line 26. This redistribution of mass in putter head 20 may also be done in such a manner that the geometric center of face 22 still lies on line 26. This design feature is important because of the natural tendency of a player to want to strike the ball with the center of the face of the putter. When a putter according to the present invention is designed to incorporate C'_{g, putter} and C'_{g, head}, swinging the putter and striking a ball with the putter do not cause acceleration- or force-induced moments around line 26. Thus, the player may more easily develop the touch necessary to control the speed and direction of a putt.

While certain embodiments of the present invention have been described above, these descriptions are given for purposes of illustration and explanation. Variations, changes, modifications and departures from the devices and methods disclosed above may be adopted without departure from the scope or spirit of the present invention which, in sum, is a putter that, among other features, is configured such that it hangs in a balanced manner directly from the player's shoulder joint when used to stroke a putt with a modified croquet style putting stroke.

I claim:

1. A golf putter for use in a one-handed, modified croquet-style putting stroke, comprising:

- a head defining a head center of mass and comprising a face defining a face angle line having a midpoint;
- a shaft extending from the head to a free end and defining a shaft axis such that an angle of at least ten degrees is formed by:
 - a projection of the shaft axis onto a first plane that is vertical when the putter is in a normal address position and containing the face angle line and
 - a line also within the plane that is perpendicular to the face angle line; and
- a grip mounted on the free end of the shaft such that the grip is approximately bisected by a second plane that:
 - is perpendicular to the face angle line and
 - contains the midpoint of the face angle line.

2. The golf putter of claim 1 in which the shaft further comprises:
 - a. a connector portion having a first end connected to the head and a second end and
 - b. a straight portion connected to the second end of the connector portion and in which the shaft axis is defined by the straight portion and the free end of the shaft is on the straight portion.
3. The golf putter of claim 2 in which:
 - a. the combination of the grip, head, and shaft define a putter center of mass; and
 - b. the center of mass of the head is positioned so that the putter center of mass is located on the second plane.
4. The golf putter of claim 3 in which the grip further comprises a bore that is disposed at an angle from vertical when the putter is in a normal address position such that a longitudinal axis of the grip is substantially vertical.
5. The golf putter of claim 4 in which the grip further comprises a first flat land.
6. The golf putter of claim 5 in which the grip further comprises a second flat land.
7. The golf putter of claim 1 in which the grip further comprises a bore that is disposed at an angle from vertical when the putter is in a normal address position such that a longitudinal axis of the grip is substantially vertical.
8. The golf putter of claim 7 in which the grip further comprises a first flat land.
9. The golf putter of claim 8 in which the grip further comprises a second flat land.
10. The golf putter of claim 1 in which:
 - a. the combination of the grip, head, and shaft define a putter center of mass; and
 - b. the center of mass of the head is positioned so that the putter center of mass is located on the second plane.
11. The golf putter of claim 10 in which the grip further comprises a bore that is disposed at an angle from vertical when the putter is in a normal address position such that a longitudinal axis of the grip is substantially vertical.
12. The golf putter of claim 11 in which the grip further comprises a first flat land.
13. A golf putter for use in a one-handed, modified croquet-style putting stroke, comprising:
 - a. a head defining a head center of mass and comprising a face defining a face angle line;
 - b. a shaft extending from the head, comprising:
 - i. connector portion having a first end connected to the head and a second end;
 - ii. a straight portion connected to the second end of the connector portion and extending to a free end; and
 - iii. defining a shaft axis along the straight portion such that an angle of at least ten degrees is formed by:
 - A. a projection of the shaft axis onto a plane that is vertical when the putter is in a normal address position and containing the face angle line and
 - B. a line also within the plane that is perpendicular to the face angle line;
 - c. a grip mounted on the free end such that when a player grasps the grip with one hand and addresses a golf ball, the head center of mass, the grip, and the player's shoulder lie along a substantially vertical line; and
 - d. in which:
 - i. the combination of the grip, head, and shaft define a putter center of mass; and
 - ii. the head center of mass is located so that the putter center of mass is located on a second plane that:

- A. is perpendicular to the face angle and
 - B. contains the midpoint of the face angle line.
14. A golf putter, comprising:
 - A. a head defining a head center of mass and comprising a face defining a face angle line;
 - B. a shaft extending from the head to a free end and defining a shaft axis such that an angle of at least ten degrees is formed by:
 - i. a projection of the shaft axis onto a plane that is vertical when the putter is in a normal address position and containing the face angle line and
 - ii. a line also within the plane that is perpendicular to the face angle line;
 - C. a grip mounted on the free end; and
 - D. in which:
 - i. the combination of the grip, head, and shaft defines a putter center of mass; and
 - ii. the head center of mass is located so that the putter center of mass is located in a second plane that:
 - a. is perpendicular to the face angle line and
 - b. contains the midpoint of the face angle line.
15. The golf putter of claim 14, in which the shaft further comprises:
 - A. a connector portion having a first end connected to the head and a second end and
 - B. a straight portion connected to the second end of the connector portion and in which the shaft axis is defined by the straight portion and the free end of the shaft is on the straight portion.
16. The golf putter of claim 15, in which the grip further comprises a bore that is disposed at an angle from vertical when the putter is in a normal address position such that a longitudinal axis of the grip is substantially vertical.
17. The golf putter of claim 16, in which the grip further comprises a first flat land.
18. The golf putter of claim 17, in which the first flat land is substantially parallel to the plane.
19. The golf putter of claim 18, in which the grip further comprises a second flat land.
20. The golf putter of claim 19, in which the second flat land is substantially parallel to the plane.
21. The golf putter of claim 14, in which the grip further comprises a bore that is disposed at an angle from vertical when the putter is in a normal address position such that a longitudinal axis of the grip is substantially vertical.
22. The golf putter of claim 21, in which the grip further comprises a first flat land.
23. The golf putter of claim 22, in which the first flat land is substantially parallel to the plane.
24. The golf putter of claim 23, in which the grip further comprises a second flat land.
25. The golf putter of claim 24, in which the second flat land is substantially parallel to the plane.
26. A golf putter for use in a one-handed, modified croquet-style putting stroke, comprising:
 - A. a head defining a head center of mass and comprising a face defining a face angle line;
 - B. a shaft extending from the head to a free end and defining a shaft axis such that an angle of at least ten degrees is formed by:
 - i. a projection of the shaft axis onto a plane that is vertical when the putter is in a normal address position and containing the face angle line and
 - ii. a line also within the plane that is perpendicular to the face angle line;

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- C. a grip mounted on the free end such that when a player grasps the grip with one hand and addresses a golf ball, the head center of mass, the grip, and the player's shoulder lie along a substantially vertical line; and
- D. in which: 5
- i. the combination of the grip, head, and shaft define a putter center of mass; and

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- ii. the head center of mass is located so that the putter center of mass is located in a second plane that:
- a. is perpendicular to the face angle line and
- b. contains the midpoint of the face angle line.

* * * * *

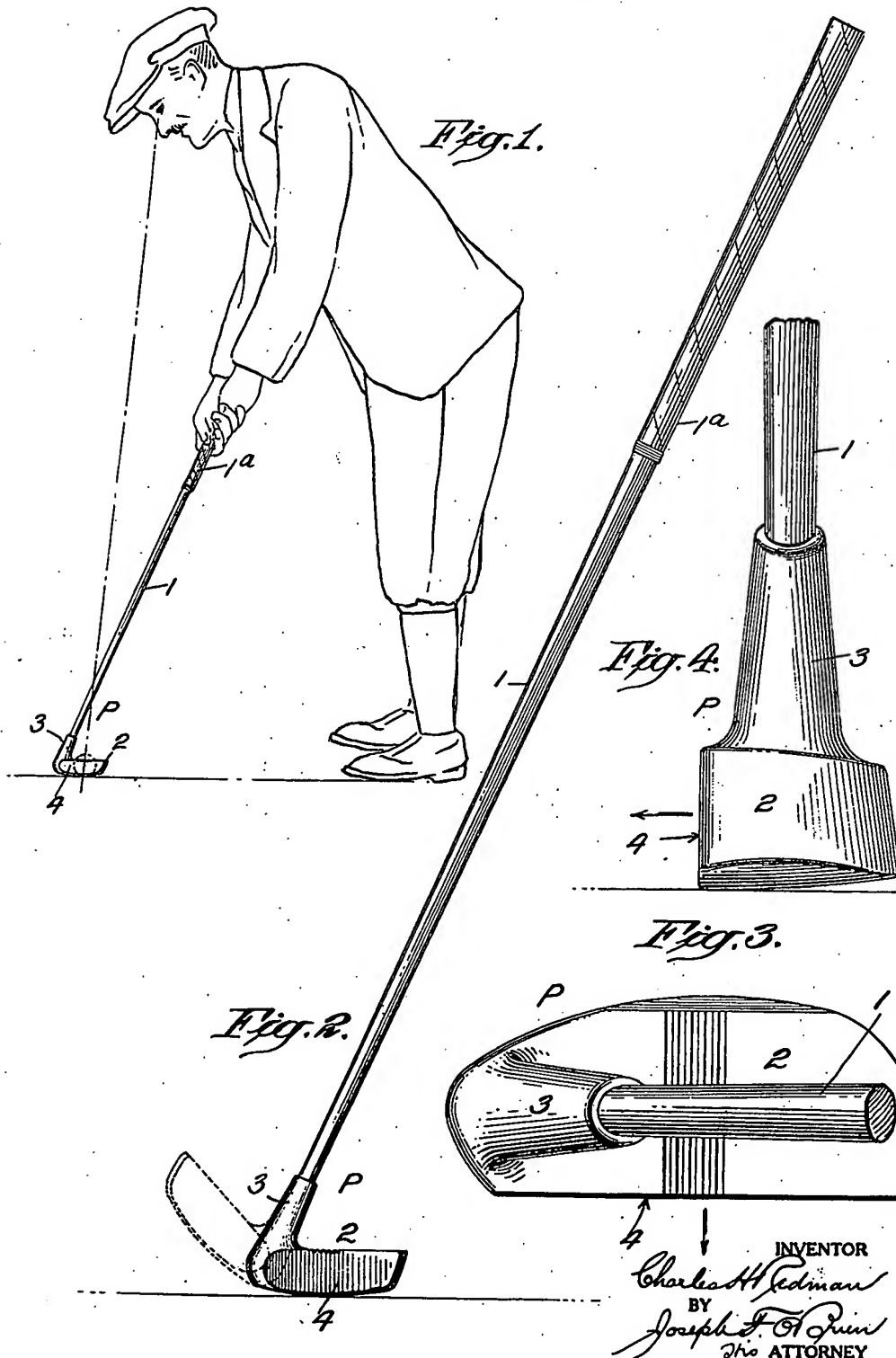
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GOLF CLUB

Filed July 3, 1924



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UNITED STATES PATENT OFFICE.

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GOLF CLUB.

Application filed July 3, 1924. Serial No. 723,905.

This invention relates to golf clubs and more particularly to putters.

Accuracy and proper balance or "feel" are desirable characteristics in a putter. Accuracy is promoted by the use of a club which may be readily and quickly squared with the line of play, or placed in striking position with its striking face perpendicular to such line, and it is one of the objects of this invention to facilitate such squaring of the club with the line of play.

Another object of my invention is to produce a club in which the shaft and head are connected in inclined relationship and the connection of the shaft with the head, which is preferably made by means of a hosel integral with the head, is located at the outer end of the latter and at the end of the head which is more remote from the handle portion of the staff, so as to cause the head (instead of projecting outwardly and away from the player as in the conventional club) to extend when in playing position inwardly from the staff, the major part of the head lying between the said connection or hosel and the player and the staff extending longitudinally over the said head so as to cross transversely over the line of play.

Another object of my invention is to produce a club in which the staff and head are so arranged that when the club is held loosely in horizontal position or in an inclined plane there will be a tendency on the part of the club to rotate automatically about the staff as an axis into a position in which the striking face will be substantially perpendicular with the line of play, and to that end I arrange the center of gravity of the head and shaft at a point within the head proper and between the outer end of the striking face and the player, and preferably in substantial alignment with the axis of the shaft.

Another object of my invention is to produce a club having a head provided at its said outer or remote end with a hosel extending upwardly at a relatively sharp acute angle as to cause the shaft to extend over the head in an inclined plane, transversely crossing the line of play and having its axis in a vertical plane substantially parallel with the striking face.

Another object of my invention is to provide a putter having a head and a shaft connected with the head at its outer end and forming such an acute angle that the shaft

extends completely over the head longitudinally and is provided with striking face extending substantially the entire length of the head in a vertical plane substantially parallel with the axis of said shaft, so that in playing the staff extends between the eyes of the player and said head, and may be utilized as an elongated sighting element.

Another object of my invention is to provide a club in which the center of gravity of the head and shaft is so arranged that when held horizontally or in an inclined position, the head will automatically rotate into a position in which the striking face and the axis of the shaft will be in parallel planes, thus automatically assuming a playing position in which the striking face is substantially squared or in perpendicular relationship with the line of play.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation of a player holding my improved golf club in putting position;

Fig. 2 is an enlarged side elevation as seen from the line of play of a club embodying my invention;

Fig. 3 is a further enlarged plan view of the head, hosel and portion of the shaft of the club; and

Fig. 4 is a rear end elevation of the head, hosel and a portion of the shaft of my said club.

Referring now to these drawings, which illustrate a preferred embodiment of my invention, I have illustrated a putter P having a shaft 1 provided at one end with the usual handle portion 1^a and connected at its opposite end to the outer end or that end of the head 2 which is more remote from the handle 1^a, so that the head in playing position will extend inwardly from the shaft toward the player instead of projecting outwardly away from the player as in the conventional club. The connection between the shaft 1 and head 2 is preferably made, as shown, by providing the head with an integral hosel 3 at said outer end. Said head

also has a striking face 4 preferably extending longitudinally the length of the head and arranged, in the embodiment illustrated, at the left-hand side thereof which is the side facing the direction in which it is desired to play. The hosel, as shown, extends upwardly from the head at such a relatively sharp acute angle so as to cause the shaft to extend longitudinally over and above the entire head, to cross transversely the line of play and to intersect the line of vision of the player.

In the preferred form of my invention illustrated, the axis of the shaft is arranged in a plane substantially parallel with the striking face and the side edge of the staff will likewise be substantially parallel with said striking face. In view of the fact that the shaft is positioned between the eyes of the player and the top face of the head, it will, of course, give a much longer line than the striking face, and the shaft may therefore be used as a sighting element to more accurately square the striking face with the line of play.

The center of gravity of the head and staff are preferably so arranged that when the club is loosely held in horizontal or inclined position, the head of the club will have a tendency to rotate automatically toward playing position and in the preferred embodiment the center of gravity is so arranged that the head will rotate into a position in which the striking face will be squared or perpendicular to the line of play. This result is preferably accomplished by arranging the center of gravity of the head and staff well within the head at a point in alignment with the axis of the shaft so as to cause rotation or oscillation of the head to stop at a point where the striking face will be parallel to the axis of the shaft.

The angle of inclination between the head and shaft is such that the shaft will be caused to assume approximate playing position or inclination when the bottom of the head is rested on the ground or, in the alternative, when the staff is held at proper playing inclination the head will extend inwardly toward the player and the longitudinal axis thereof will be parallel with the ground.

I have found that when the longitudinal

axes of the head and shaft are joined at a relatively sharp angle, viz., approximately 65°, the shaft will be automatically tilted into an effective playing position or inclination, the head, of course, extending toward the player as above specified, and the shaft crossing the line of play and intersecting the line of vision of the player.

While in the embodiment shown the angle between the head and shaft is approximately 65°, it will be understood that any angle may be employed which will cause the head when in playing position to extend toward the player and the shaft to extend longitudinally over the major portion of the head across the line of play.

Having described my invention, I claim:—
1. A golf club embodying a head having substantially parallel upper and lower surfaces and a staff portion connected to said head at the end more remote from the handle portion at such an angle as to cause the staff to extend longitudinally over and completely across the said head when the same is in playing position, whereby the staff will intersect the line of vision of the player.

2. A golf club embodying a head having substantially parallel upper and lower surfaces and a staff portion connected to said head at the end more remote from the handle portion at such an angle as to cause the staff to extend longitudinally over and completely across said head and provide a major portion of the handle extending beyond a vertical plane intersecting the projecting end of said head.

3. A golf club embodying a head having substantially parallel upper and lower surfaces and a staff portion connected to said head at the end more remote from the handle portion at such an angle as to cause the staff to extend longitudinally over and completely across said head and provide a major portion of the handle extending beyond a vertical plane intersecting the projecting end of said head, said parts having their center of gravity arranged to cause the head when held loosely in horizontal or inclined position to rotate toward the playing position of the club.

In witness whereof, I have signed my name to the foregoing specification.

CHARLES H. REDMAN.

RELATED PROCEEDINGS APPENDIX

None.